Risk-Based Corrective Action Evaluation
Plattsburgh AFB

SITE ST-003, BUILDING 205

Contract No.
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Revision 1.0

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RISK-BASED CORRECTIVE ACTION EVALUATION
SITE SS-003, BUILDING 205

Prepared for:

Air Force Center For Environmental Excellence
Brooks Air Force Base, Texas
and
Plattsburgh Air Force Base - Base Conversion Agency
Plattsburgh Air Force Base, New York

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Note: Data validation and usability reports, groundwater monitoring can be found in FPM's report, "Site Characterization of Underground Storage Tanks Plattsburgh AFB," April 1999.

Building 205, located at Plattsburgh Air Force Base, Plattsburgh, New York, was evaluated using the NYSDEC's "**Interim Procedures for Inactivation of Petroleum-Impacted Sites**".

The available data from the monitoring wells and borings indicates that soil impacts at the site are minimal and groundwater impacts at the site are localized in the vicinity of MW-030-005. Benzene, toluene, ethylbenzene, total xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, fluorene, phenanthrene, napthalene and pyrene are the constituents of concern (COCs) at the site.

There is no history of shallow groundwater use in the city of Plattsburgh, hence the shallow groundwater ingestion pathway is incomplete.

Site conceptual exposure model for the site indicates that the complete exposure pathways exist for (i) potential future construction worker, and (ii) future on-site resident (adult and child). The representative site concentrations were compared to the Tier 1 RBSLs. The key findings are:

Construction worker

- Maximum site-specific concentrations of VOCs and SVOCs in soil and groundwater are significantly lower than the respective Tier 1 RBSLs.

Resident-Adult

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.

Resident Child

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.
- Maximum site-specific concentrations of **napthalene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the respective Tier 1 RBSLs developed based on indoor inhalation of vapors.

Tier 2 site-specific target levels (SSTLs) were developed for the future on-site resident (adult and child) using a combination of site-specific and default data. The representative soil and groundwater concentrations of naphthalene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene have been below the Tier 2 target levels. However, the maximum benzene concentration in soil exceeds the Tier 2 target level. Since the fate and transport models used to estimate the emissions from soil are very conservative, soil vapor measurements 2 to 3 ft below ground surface (bgs) were performed. Six soil vapor samples were collected from around the building.

Soil vapor concentrations for each of the COCs at each of the six borings were below the Tier 2 SSTLs. Therefore the site does not pose unacceptable risk from the indoor inhalation pathway and should be closed with no further action.

Additionally, one indoor air and one ambient air sample was collected and analyzed for the COCs. Concentrations of benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene exceeded the allowable indoor air concentrations. However, the results are most likely an artifact of sampling due to (i) the inherent uncertainties and variability in indoor air sampling, (ii) samples were collected over a very short duration (1 hr), (iii) the concentrations that exceed target levels are all estimated and have a "J" qualifier, and (iv) the building has been closed and not used for a long period prior to sampling and the

ventilation at the building may not be comparable to the ventilation that occurs in an occupied building.

Based on the above, we recommend confirmatory sampling of indoor and ambient air concentrations for benzene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene over a 8 or 24-hr period after adequate ventilation of the building.

1.0 INTRODUCTION

The Building 205 located at Plattsburgh Air Force Base, Plattsburgh, New York was evaluated in accordance with the NYSDEC's "**Interim Procedures for Inactivation of Petroleum-Impacted Sites**".

1.1 SCOPE AND OBJECTIVES

This study involved the following tasks:

- data review and identification of the constituents of concern (COCs);
- identification of current and potential future human receptors at the site;
- identification of exposure scenarios for each receptor;
- comparison of representative site concentrations with Tier 1 risk-based screening levels (RBSLs)
- if representative site concentrations exceed Tier 1 RBSLs, development of Tier 2 site-specific target levels (SSTLs);
- conclusions and recommendations based on the Tier 2 analysis.

This report consists of 7 sections including this introductory section outlined in the table of contents.

2.1 INTRODUCTION

This chapter presents site-specific data and relevant information used for risk assessment at the Building 205, Plattsburgh Air Force Base, New York.

2.2 SITE DESCRIPTION

Following is a brief description of the site as (that includes Building 205 and the immediately surrounding area impacted by the release) shown in Figure 2-1.

The facility is briefly described below:

- Currently the site consists of a vacant military family housing unit.
- Four underground storage tanks (USTs) containing heating oil were removed from the southern side of the building.
- The area around the building is covered with vegetation and grass.
- Towards the north is the Base boundary and a major road. Across the road is a commercial building that housed the army reserve. The base boundary is immediately north of the building.
- Towards the east, west, and south are residential units.
- Surface water from the site drains into a storm sewers located northwest of Building 205. The sewer discharges into the Saranac River (north of the Base).

2.3 CHRONOLOGY OF EVENTS

The chronology of events at the site based on reports reviewed is outlined below. Figure 2-1 shows the locations of the soil borings.

1982	Surface leak of heating oil from the site migrated into the storm sewer located northwest of the site. The storm sewer discharges into the Saranac River located further north of the site.
1982-1995	Investigations conducted at the site revealed soil and groundwater impacts at the site. Data from these investigations is not available.

October 1996 — Four geoprobe soil borings (01-05-B through 04-05-B) were advanced near the building. Groundwater samples were collected from each boring and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

May 1997 — Three borings 06-05-B, 08-04-B, and 09-05-B were advanced near the building. One soil sample was collected from each boring and analyzed for VOCs and SVOCs.

Seven additional geoprobe borings 05-05-B through 011-05-B were advanced around the building. One groundwater sample was collected from each boring and analyzed for VOCs and SVOCs.

April 1998 — Six soil vapor borings SV-1 through SV-6 were drilled around the former tank location and Building 205 B. One soil vapor sample per boring was collected using a pump and two sorbent tubes in series. One indoor air sample P-205-A-B1-AA and one ambient air sample P-205-A-B1-FB were also collected. Addtionally, one indoor air measurement was performed in an unimpacted building (Building 828).

2.4 SITE STRATIGRAPHY AND HYDROGEOLOGY

Figure 2-2 is a generalized cross-section of the soil stratigraphy at the site.

- Beneath the ground surface, sand was encountered to a depth of 25 ft bgs and a layer of silt up to a depth of 40 ft bgs.
- A layer of glacial till was encountered to a depth of 60 ft bgs.
- Below 60 ft a layer of bedrock extends to a maximum depth of investigation of 70 ft bgs.
- The average depth to groundwater at the site is 2-5 ft bgs.

- Groundwater appears to flow in the approximate direction of north-northwest towards the Saranac river.

2.5 CHEMICAL DATA

2.5.1 Chemicals in Soil

Soil analytical results are presented in Table 2-1. Following are the key conclusions:

- The primary COCs in soil at the site consist of the VOCs benzene, ethylbenzene, total xylenes, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene. Several other COCs were also detected and include the SVOCs napthalene, fluorene, phenanthrene and pyrene.

2.5.2 Chemicals in Groundwater

Groundwater analytical results are presented in Table 2-2. The key conclusions are discussed below:

- The groundwater impacts are localized in the vicinity of borings 02-05-B and 011-05-B that are located adjacent to the former USTs area.

- Boring 09-05-B exhibits groundwater impacts indicating that a groundwater plume may be present under the building.

- The primary COC detected in groundwater samples consist of benzene, ethylbenzene, toluene, total xylenes, napthalene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, fluorene, phenanthrene and pyrene.

2.6 LAND USE

2.6.1 Current Land Use

The site currently has a vacant building. There are several residential establishments in the area surrounding the site as discussed in Section 2.2.

2.6.2 Future Land Use

The site is located in a residential area in Plattsburgh Air Force Base, New York. Since the facility is surrounded by residences, it is likely that the future land use is likely to be residential.

2.7 WATER USE

The site lies in the Lake Champlain Valley. Groundwater in the Plattsburgh area occurs in both unconsolidated overburden deposits and consolidated bedrock. Locally, water yields from wells screened in unconsolidated deposits vary from several hundred gallons per minute (gpm) to a few gpm. Lake Champlain supplies water to the individual homes and small communities in the vicinity. Several houses in the area are supplied with water by the private wells generally screened in the bedrock. Regional hydrogeology indicates that no developable water bearing zone exists in the top 15-20 ft bgs and below that there is tight clay layer.

3.0
EXPOSURE ASSESSMENT

3.1 SITE CONCEPTUAL EXPOSURE MODEL (SCEM) FOR CURRENT CONDITIONS

Currently the site has a vacant building. Hence the only receptors are visitors or individuals who may walk across the site. Since the exposure frequency of such a receptor will be very small, the risk for these receptors was not quantified.

3.2 SITE CONCEPTUAL EXPOSURE MODEL (SCEM) FOR POTENTIAL CONSTRUCTION ACTIVITY

Exhibit 3-2 and Figure 3-1 show SCEM during the construction activity period, for which the construction worker is the most exposed receptor due to (i) proximity to the source, and (ii) number of complete routes of exposure. Thus, risks and hazard indices to other potential receptors during the period of construction need not be quantified. Note that "C" denotes complete and "NC" denotes incomplete pathway.

EXHIBIT 3-2. SCEM FOR POTENTIAL CONSTRUCTION ACTIVITY

Scenario, Receptor, and Pathways / Routes Analyzed	C or NC	Justification
Most exposed receptor: Construction Worker		
Outdoor Inhalation of Vapors from Soil	C	Vapor emission from impacted soil.
Outdoor Inhalation of Particulate emissions	C	Soil maybe exposed during construction.
Outdoor Inhalation of Vapors from Groundwater	C	Vapor emission from impacted groundwater is possible.
Dermal Contact with Soil	C	Soil is typically exposed during construction.
Ingestion of Soil	C	Accidental soil ingestion is possible.
Dermal Contact with Groundwater	C	Dermal contact with groundwater is possible since the average depth to groundwater is approximately 2 ft bgs.
Ingestion of Groundwater	NC	No drinking water wells on-site

3.3 SITE CONCEPTUAL EXPOSURE MODEL (SCEM) FOR FUTURE CONDITIONS

Exhibit 3-3 and Figure 3-1 show the site-specific conceptual exposure model (SCEM) for future conditions. Note that "C" denotes complete and "NC" denotes incomplete pathway.

EXHIBIT 3-3. SCEM FOR FUTURE CONDITIONS

Scenario, Receptor, and Pathways / Routes Analyzed	C or NC	Justification
Most exposed receptor: On-site Residents (Adult and child)		
Indoor Inhalation of Vapors from Soil	C	The existing building may be occupied or a new one constructed. Vapor from soil can penetrate through cracks in the floor. Hence indoor exposure to vapors from soil is likely.
Outdoor Inhalation of Particulate emissions	C	Soil maybe exposed in a residential scenario.
Indoor Inhalation of Vapors from Groundwater	C	A residence may be constructed over the groundwater plume. Vapor from groundwater can penetrate through cracks in the asphalt cover. Hence indoor exposure to vapors from groundwater is likely.
Dermal Contact with Soil	C	Soil maybe exposed in a residential scenario.
Ingestion of Soil	C	Soil is typically exposed in a residential scenario.
Dermal Contact with Groundwater	NC	No drinking water well on-site and the area is supplied by the municipality.
Ingestion of Groundwater	NC	No drinking water well on-site and the area is supplied by the municipality.
The following other receptors were considered but risk were not calculated because it would be less than the on-site resident:		
Off-site Residents		Located at a greater distance from the impacted area than the on-site resident.
On-site Maintenance Worker		Significantly shorter exposure duration and lower frequency compared to the on-site resident.
Visitor		Significantly shorter exposure duration and lower frequency than the on-site resident.

4.1 INTRODUCTION

Tier 1 risk-based screening levels (RBSLs) are conservative corrective action goals which are based on non-site specific generic fate and transport and exposure parameters, aesthetic criteria, and other appropriate standards such as maximum contaminant levels (MCLs) for potable groundwater use. Tier 1 allows for selection of exposure scenarios based on current and future land use (e.g., residential, industrial), receptors, and institutional controls. The Tier 1 levels are calculated using very conservative assumptions, thus rendering it appropriate for a screening level analysis.

4.2 TIER 1 RISK-BASED SCREENING LEVELS

Following are the conclusions based on the comparison of the site-specific concentrations with the RBSLs as presented in Table 4-1:

Construction worker

- Maximum site-specific concentrations of VOCs and SVOCs in soil and groundwater are significantly lower than the respective Tier 1 RBSLs.

Resident Adult (Future)

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

Resident Child (Future)

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **napthalene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

4.3 RECOMMENDATIONS BASED ON TIER 1 EVALUATION

After the comparison with the RBSLs, if the site-specific concentrations exceed the RBSLs, the NYSDEC allows selection of one of the following 3 alternatives:

Alternative 1: Remediation/removal of localized hot-spots on-site.

Alternative 2: Remediation to Tier 1 levels.

Alternative 3: Proceed with Tier 2 RBCA evaluation of the chemicals and the routes of exposure for which the RBSLs are exceeded.

Selection of alternative 1, 2 or 3 is essentially a cost-benefit decision. For this site, it was decided to conduct a Tier 2 analysis using available site-specific data. Hence, Tier 2 SSTLs were developed for indoor inhalation of benzene, 1,3,5-Trimethylbenzene and 1,2,4-Trimethylbenzene from soil and groundwater for the future adult and child resident. In addition Tier 2 SSTLs were developed for indoor inhalation of naphthalene from soil and groundwater for the future child resident.

5.0
TIER 2 - SITE-SPECIFIC EVALUATION

5.1 INTRODUCTION

Tier 2 site-specific target levels (SSTLs) are corrective action goals which are based on site-specific fate and transport parameters. To develop the Tier 2 SSTLs, the models recommended by the NYSDEC Interim Guidance were used. Tables 5-1(a) and 5-1(b) show the input parameters used. The following parameters were modified from the Tier 1 default values to reflect the site-specific conditions (also see Table A-1, Appendix A):

1. The **depth to groundwater** was changed to the average site-specific depth of shallow groundwater of 60.96 cm (2 feet). The **thickness of the vadose zone** (55.96 cm) is the depth of groundwater less the thickness of the capillary fringe (5 cm).

2. For the future on-site resident, the **areal fraction of cracks** was reduced from 0.01 to 0.001. This implies that 0.1% of the floor area is devoid of concrete and has the same characteristics as the underlying soil. This is reasonable, since the construction of a new building on-site and/or the refurbishment of the existing building would reduce any cracks in the floor.

3. Site-specific **organic carbon content** in soil of 0.00278 g organic carbon/ g soil was used.

4. The Tier 1 default **porosity** of 0.38 cc/cc was retained whereas site-specific **water content** of 0.17 cc/cc were used. In addition the water content in the capillary fringe was estimated as 90% of porosity.

5. **Depth to subsurface impacted soil** was assumed as 30.48 cm (1 ft).

5.2 SITE-SPECIFIC TARGET LEVELS

Table 5-2 presents the estimated Tier 2 groundwater SSTLs for future resident adult and child and compares them with the representative site concentrations. Key conclusions are as follows:

DEPARTMENT OF THE AIR FORCE
AIR FORCE BASE CONVERSION AGENCY

May 9, 2000

MEMORANDUM FOR NYS DEPT OF ENVIRONMENTAL CONSERVATION
ATTN: MR. ART STEMP
Office of Environmental Quality, Region V
Route 86, PO Box 296
Ray Brook NY 12977-0296

FROM: AFBCA/DA Plattsburgh
22 US Oval Suite 2200
Plattsburgh NY 12903

SUBJECT: Risk-Based Corrective Action Evaluation for IRP Sites ST-003 (Building 205) and ST-030 (Former BX Gas Station)

Attached for your information are Risk-Based Corrective Action Evaluations for IRP Sites ST-003 and ST-030. Both reports were provided previously but did not include the data validation and usability reports the attached reports include the data validation and usability reports.

Our POC is Dave Farnsworth at (518) 563-2871, ext 15.

MICHAEL D. SOREL, PE
Site Manager/BRAC Environmental Coordinator

Attachments:
1. Risk-Based Corrective Action Evaluation, Site ST-003
2. Risk Based Corrective Action Evaluation, Site ST-030

cc:
NYSDEC (Mr. James Quinn) w/o Atch

- The representative site concentration (maximum) of benzene, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene in groundwater are below the respective Tier 2 SSTL developed for future on-site resident adult and based on indoor inhalation.

- The representative site concentration (average) of benzene, napthalene, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene in groundwater are below the respective Tier 2 SSTL developed for future on-site resident child based on indoor inhalation. It should be noted that maximum concentrations of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene exceeded the Tier 2 SSTL.

- The representative site concentration (maximum) of benzene in soil was above the respective Tier 2 SSTL developed for future on-site resident adult and based on indoor inhalation. Since benzene was only detected in one soil sample an average concentration could not be extrapolated from the available data. 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene maximum concentrations were below their respective Tier 2 SSTLs.

- The representative site concentration (maximum) of benzene in soil was above the respective Tier 2 SSTL developed for future on-site resident child and based on indoor inhalation. Since benzene was only detected in one soil sample an average concentration could not be extrapolated from the available data. 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene average concentrations were below their respective Tier 2 SSTLs . It should be noted that maximum concentrations of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene exceeded the Tier 2 SSTL.

5.3 CONSIDERATION OF SHALLOW GROUNDWATER

The site is located in an area where water is supplied by the city of Plattsburgh. Therefore it is unlikely that a water well would be installed in the the vicinity of the site.

5.4 SOIL CONCENTRATIONS PROTECTIVE OF GROUNDWATER

Since soil concentrations are essentially non-detect, there is no residual soil causing any further loading to the groundwater. Hence soil leaching to groundwater pathway is considered incomplete.

5.5 RECOMMENDATIONS BASED ON TIER 2 EVALUATION

Within the RBCA program, a Tier 2 evaluation can result in one of the following three recommendations.

1. No further action if the Tier 2 SSTLs are below the representative site concentrations.

2. Site remediation to Tier 2 SSTLs if the SSTLs exceed the site-specific levels.

3. Performance of Tier 3 evaluation.

For this site the maximum benzene concentration in soil exceeds the Tier 2 SSTLs for the indoor inhalation pathway. Since the models used to estimate the emissions from soil are very conservative, a soil vapor survey was performed 2 to 3 ft below the surface in the vicinity of building 205B. The measured concentrations should be compared to the soil vapor target concentrations in Table 5-3.

5.6 MEASUREMENT OF VAPORS IN SOIL

In response to the recommendations discussed above, a soil vapor survey was conducted at the site. Six soil vapor samples P-205-V-01-02-AA through P-205-V-06-02-AA (refer to Figure 2-1) were collected at a depth of 2 ft and analyzed for VOCs. One liter of soil vapors were withdrawn using a pump and volatile organics were collected on sorbent tubes and analyzed using EPA Method 5041, Volatile Organic Sampling Trains (VOST) for EPA Target Compound List (TCL) or NYSDEC Spill Technology and Remediation Sercices (STARS) Compounds. Laboratory analytical results including QA/QC data validation and usability reports, chain of custody forms, and validated Form 1's are included in Appendix D. The results are tabulated in Table 5-4.

The soil vapor concentrations were compared to the Tier 2 soil vapor SSTLs in Table 5-4. As per the contract laboratory procedure (CLP), the analytical data has been qualified as "U" (below-detection), "J" (estimated), "UJ" (below detection, however is an estimated detection

limit) and "R" (rejected). Soil vapor concentrations for all the analytes from all the six borings were below the Tier 2 SSTLs protective of indoor inhalation.

Based on these results, the indoor inhalation pathway is not expected to pose unacceptable risk, hence the site should be closed with no further action.

5.7 MEASUREMENT OF VAPORS IN INDOOR AND AMBIENT AIR

In addition to the soil vapor measurement, ambient and indoor air samples were also collected. One ambient air sample in the vicinity of Building 205B, P-205-A-B1-FB, and one indoor air sample, P-205-A-B1-AA, were analyzed for VOCs. Ambient air samples were collected over a minimum duration of one hour with sample volume of ten liters in accordance with NYSDOH's Draft Indoor Air Sampling and Analysis Protocol. Air samples were analyzed by EPA method T01/T02, Air and Gas Sorbent Tube Method for EPA TCL or STARS compounds. Analytical results for indoor and ambient air concentrations are tabulated in Table 5-5. As per the contract laboratory procedure (CLP), the analytical data has been qualified as "U" (below-detection), "J" (estimated), "UJ" (below detection, however is an estimated detection limit) and "R" (rejected). Similar measurements were conducted at other sites at Plattsburgh AFB such as former BX Gas Station, Buildings 864 and 828. Following are the key findings:

- Concentrations of benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene exceed the allowable indoor air concentrations.
- In general the indoor air concentrations exceed the outdoor air concentrations.
- However, the results are most likely an artifact of sampling due to (i) the inherent uncertainties and variability in indoor air sampling, (ii) samples were collected over a very short duration (1 hr), (iii) the concentrations that exceed target levels are all estimated and have a "J" qualifier, and (iv) the building has been closed and not used for a long period prior to sampling and the ventilation at the building may not be comparable to the ventilation that occurs in an occupied building.

Based on the above we recommend confirmatory sampling of indoor and ambient air for benzene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene over a 8 or 24-hr period after adequate ventilation of the building.

6.0
CONCLUSIONS AND RECOMMENDATIONS

Building 205 located at Palttsburgh Air Force Base, Plattsburgh, New York was evaluated using the NYSDEC's **"Interim Procedures for Inactivation of Petroleum-Impacted Sites"**.

1. The available data from the monitoring wells and borings indicates that soil and groundwater impacts are localized in the vicinity of the former UST area. BTEX, napthalene, and PAHs were the chemicals of concern at the site.

2. Since there is no history of shallow groundwater use in the city of Plattsburgh, and the area is supplied with water by the city of Plattsburgh, the shallow groundwater ingestion pathway is incomplete.

3. Site conceptual exposure model for the site indicates that the complete exposure pathways exist for (i) potential future construction worker, and (ii) future on-site resident (adult and child). The representative site concentrations were compared to the Tier 1 RBSLs. The key conclusions were:

Construction worker

- Maximum site-specific concentrations of VOCs and SVOCs in soil and groundwater are significantly lower than the respective Tier 1 RBSLs.

Resident-Adult

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

Resident Child

- Maximum site-specific concentrations of **benzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

- Maximum site-specific concentrations of **napthalene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,3,5-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.
- Maximum site-specific concentrations of **1,2,4-Trimethylbenzene** in soil and groundwater exceed the Tier 1 RBSLs for indoor inhalation of vapors.

4. Tier 2 site-specific target levels (SSTLs) were developed for the future on-site adult and child resident using a combination of site-specific and default data. The results indicate that the maximum benzene concentration on-site exceeds the Tier 2 SSTL developed for the resident adult and child based on indoor inhalation.

5. Considering that the models used to estimate the emissions from soil are very conservative, a soil vapor survey 2 to 3 ft below the surface in the vicinity of Building 205B was performed. Comparison of measured soil vapor concentrations to soil vapor SSTLs indicated that all COCs at all locations were below the soil vapor SSTLs. Thus the indoor inhalation pathway is not expected to pose unacceptable risk. Hence the site should be closed with no further action.

7. In addition to the soil vapor measurement, ambient and indoor air samples were also collected. Analytical results for indoor and ambient air concentrations are tabulated in Table 5-6. Following are the key findings:

   - Concentrations of benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene exceeded the allowable indoor air concentrations.
   - In general the indoor air concentrations exceed the outdoor air concentrations.
   - The results are most likely an artifact of sampling (discussed in section 5.7).

8. Based on the above, we recommend confirmatory sampling of indoor and ambient air concentrations for benzene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene over a 8 or 24-hr period after adequate ventilation of the building.

7.0
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APPENDIX A

TABLE A-1
SUMMARY OF SITE-SPECIFIC SOIL PARAMETERS
AT THE BUILDING 205

Sample	Water Content cc water/cc wet soil	Total Organic Carbon g organic carbon/g soil
1	0.17	0.00488
2	0.233	-
3	0.116	0.000689
4	0.156	-
Average	0.16875	0.00278

APPENDIX B

TABLE 2-1
SUMMARY OF CHEMICALS IN SOIL
AT BUILDING 205

Chemicals	P-0205A-S-		P-0205B-S-	
	[mg/kg]	[mg/kg]	[mg/kg]	[mg/kg]
VOCs	08-04-B	08-04-C*	06-07-B	09-05-B
Benzene	*ND*	*ND*	*0.18j*	*ND*
Toluene	*ND*	*ND*	*ND*	*ND*
Ethylbenzene	*ND*	*0.27j*	*ND*	*1j*
Total Xylenes	*ND*	*ND*	*ND*	*0.78j*
Isopropylebenzene	0.32j	1.2j	0.17j	0.92j
n-Propylbenzene	0.36j	1.5j	0.25j	1.7j
1,3,5-Trimethylbenzene	*0.42j*	*1.6j*	*0.4j*	*2.0j*
1,2,4-Trimethylbenzene	*0.71j*	*3.4j*	*0.78j*	*6.8j*
sec-Butylbenzene	0.8j	2.5j	0.32j	1.7j
p-Isopropyltoluene	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND
Naphthalene	*ND*	*0.26j*	*0.28j*	*1.4j*
Tetrachloroethylene	ND	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND
Styrene	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND
4-Isopropyltoluene	1.3j	4.1j	0.15j	1.2j
SVOCs				
Phenol	ND	ND	ND	ND
2-methylphenol	ND	ND	ND	ND
3/4-methylphenol	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND
2-methylnapthalene	ND	ND	ND	ND
Acenaphthene	ND	0.25j	0.13j	0.55j
Fluorene	*ND*	*0.23j*	*0.18j*	*ND*
Phenanthrene	*0.19j*	*0.85j*	*0.45j*	*1.9j*
Anthracene	ND	ND	ND	ND
Fluoranthene	ND	0.053j	ND	0.056j
Pyrene	*0.43j*	*0.17j*	*0.049j*	*0.19j*
Benzo (a) anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
Benzo (b) fluoranthene	ND	ND	ND	ND
Benzo (k) fluoranthene	ND	ND	ND	ND
Benzo (a) pyrene	ND	ND	ND	ND
Dibenzo (a,h) anthracene	ND	ND	ND	ND
Benzo (g,h,i) perylene	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND
Bis(2-ethylexyl)pthalate	ND	ND	ND	ND

ND non-detect

☐ Chemicals Detected. Compounds in italic represent constituents of concern (COCs) fo

j denotes below detection limits-estimated

TABLE 2-2
SUMMARY OF CHEMICALS IN GROUNDWATER
AT BUILDING 205

Chemicals	01-05-B [mg/L]	02-05-B [mg/L]	03-05-B [mg/L]	04-05-B [mg/L]	05-05-B [mg/L]	06-05-B [mg/L]	07-05-B [mg/L]	08-05-B [mg/L]	09-05-B [mg/L]	010-05-B [mg/L]	011-05-B [mg/L]
VOCs	Oct-96	Oct-96	Oct-96	Oct-96	May-97	May-97	May-97	May-97	May-97	May-97	May-97
Benzene	*ND*	*0.067*	*0.0007j*	*ND*	*ND*	*0.001*	*ND*	*ND*	*ND*	*ND*	*0.005j*
Toluene	*ND*	*0.025j*	*0.0001j*	*ND*	*ND*	*0.0005j*	*ND*	*0.001j*	*ND*	*ND*	*0.002j*
Ethylbenzene	*ND*	*0.43*	*0.0005j*	*0.0001j*	*ND*	*0.003*	*ND*	*ND*	*0.15j*	*0.0008j*	*0.11*
Total Xylenes	*ND*	*1.69*	*0.0004j*	*ND*	*ND*	*0.0025*	*ND*	*ND*	*0.11j*	*ND*	*0.21*
Isopropylebenzene	ND	0.2	0.002	ND	ND	0.004	ND	0.004j	0.094j	0.002	0.056
n-Propylbenzene	ND	0.45	0.0009j	ND	ND	0.003	ND	0.004j	0.16j	0.001	0.051
1,3,5-Trimethylbenzene	*ND*	*0.83*	*0.0002j*	*ND*	*ND*	*0.003*	*ND*	*0.003j*	*0.28*	*0.001*	*0.058*
1,2,4-Trimethylbenzene	*ND*	*0.31*	*0.0007j*	*ND*	*0.0005j*	*0.003*	*ND*	*0.007j*	*0.72*	*0.003*	*0.2*
sec-Butylbenzene	ND	0.36	0.001	ND	ND	ND	ND	0.013	0.17j	0.006	0.023
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	*ND*	*2.2*	*0.002j*	*0.001j*	*ND*	*0.007*	*ND*	*0.01*	*0.13*	*0.007*	*0.075*
Tetrachloroethylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	ND	0.54	0.0002j	ND	ND	ND	ND	0.01j	0.27	0.003	0.052
SVOCs											
Phenol	0.0021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/4-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methylnapthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	0.34	ND	ND	ND	ND	ND	0.006j	0.31	0.002j	ND
Fluorene	*ND*	*0.69*	*ND*	*ND*	*ND*	*ND*	*ND*	*0.004j*	*0.35*	*0.001j*	*0.008*
Phenanthrene	*ND*	*1.4*	*ND*	*ND*	*ND*	*ND*	*ND*	*0.011j*	*0.97j*	*0.002j*	*0.01*
Anthracene	ND	ND	ND	ND	ND	ND	ND	0.003j	0.096	ND	0.002j
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	0.002j	0.038j	ND	ND
Pyrene	*ND*	*0.13*	*ND*	*ND*	*ND*	*ND*	*ND*	*0.003j*	*0.089*	*ND*	*ND*
Benzo (a) anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (g,h,i) perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylexyl)pthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND non-detect

Chemicals Detected. Compounds in italic represent constituents of concern (COCs) for fuel oil

j denotes below detection limits-estimated

TABLE 4-1
SUMMARY OF TIER 1 RISK-BASED SCREENING LEVELS FOR SOIL AND GROUNDWATER AT BUILDING 205

Receptor	Media-Pathway	Concentration	Benzene	Toluene	Ethylbenzene	Total Xylenes	Napthalene	Pyrene	Benzo (a) anthracene
Construction Worker	Soil-Outdoor Inhalation [mg/kg]	RBSL	12	1.92E+03	3.50E+03	1.25E+04	300	2.38E+08	3.14E+10
		Site-specific Max	0.18	ND	1	0.78	1.4	0.43	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	2.65E+02	3.52E+04	4.00E+04	3.84E+04	1380	9.28E+04	185
		Site-specific Max	0.18	ND	1	0.78	1.4	0.43	ND
	Groundwater-Outdoor Inhalation [mg/L]	RBSL	802	5.22E+04	1.33E+05	2.75E+05	3750	3.74E+06	1.35E+07
		Site-specific Max	0.067	ND	0.43	1.69	2.2	0.13	ND
Resident (Child)	Soil-Indoor Inhalation [mg/kg]	RBSL	0.022	5.89	15.5	28	0.604	4.79E+05	6.32E+07
		Site-specific Max	(0.18)	ND	1.000	0.78	(1.4)	0.43	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	10.5	5.20E+03	2.62E+03	4.53E+04	3.54E+03	3.83E+03	1.02
		Site-specific Max	0.18	ND	1	0.78	1.4	0.43	ND
	Groundwater-Indoor Inhalation [mg/L]	RBSL	0.042	11.20	27.80	60.1	1.26	2.83E+03	1.03E+04
		Site-specific Max	(0.067)	ND	0.43	1.69	(2.2)	0.13	ND
Resident (Adult)	Soil-Indoor Inhalation [mg/kg]	RBSL	0.048	65.2	172	287	1.78	1.86E+06	1.40E+08
		Site-specific Max	(0.18)	ND	1.000	0.78	1.4	0.43	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	13.5	3.34E+04	1.68E+04	3.23E+05	4.68E+04	4.15E+04	2.2
		Site-specific Max	0.18	ND	1	0.78	1.4	0.43	ND
	Groundwater-Indoor Inhalation mg/L	RBSL	0.019	24.70	61.40	133.2	2.78	6.26E+03	2.27E+04
		Site-specific Max	(0.067)	ND	0.43	1.69	2.2	0.13	ND

( ) indicates value exceeds one or more target levels
ND Not Detected

TABLE 4-1(continued)
SUMMARY OF TIER 1 RISK-BASED SCREENING LEVELS FOR SOIL AND GROUNDWATER AT BUILDING 205

Receptor	Media-Pathway	Agency	1,3,5-Trimethyl-benzene	1,2,4-Trimethyl-benzene	Acenapthene	Fluorene	Phenanthrene	Anthracene
Construction Worker	Soil-Outdoor Inhalation mg/kg	RBSL	5.63E+01	1.90E+02	2.79E+06	3.57E+06	2.67E+06	1.54E+05
		Site-specific Max	2	6.8	0.55	0.23	0.85	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	1.02E+02	1.28E+02	6.69E+04	55200	41400	213000
		Site-specific Max	2	6.8	0.55	0.23	0.85	ND
	Groundwater-Outdoor Inhalation mg/L	RBSL	2.91E+02	2.94E+02	4.32E+05	3.39E+05	1.50E+05	3.16E+03
		Site-specific Max	0.83	0.72	0.34	0.69	1.4	0.096
Resident (Child)	Soil-Indoor Inhalation mg/kg	RBSL	1.13E-01	3.82E-01	5.60E+03	7.17E+03	5.37E+03	8.39E+03
		Site-specific Max	(2)	(6.8)	0.55	0.23	0.85	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	10.4	13.1	7500	5030	3780	37200
		Site-specific Max	2	6.8	0.55	0.23	0.85	ND
	Groundwater-Indoor Inhalation mg/L	RBSL	6.77E-02	6.44E-02	2.82E+02	228	9.00E+01	173
		Site-specific Max	(0.83)	(0.72)	0.34	0.69	1.4	0.096
Resident (Adult)	Soil-Indoor Inhalation mg/kg	RBSL	2.50E-01	8.45E-01	1.24E+04	1.59E+04	1.19E+04	1.85E+04
		Site-specific Max	(2)	(6.8)	0.55	0.23	0.85	ND
	Surficial soil - ingestion, dermal contact, inhalation [mg/kg]	RBSL	67	83.7	82100	54700	41000	4.10E+05
		Site-specific Max	2	6.8	0.55	0.23	0.85	ND
	Groundwater-Indoor Inhalation mg/L	NYSDEC	1.50E-01	1.42E-01	6.24E+02	504	1.99E+02	382
		Site-specific Max	(0.83)	(0.72)	0.34	0.69	1.4	0.096

( ) indicates value exceeds one or more target levels
ND Not Detected

TABLE 5-1(a)
RESIDENT ADULT - FUTURE CONDITIONS
EXPOSURE FACTORS AND OTHER RELEVANT PARAMETERS

EXPOSURE PARAMETER	Units	Value	Reference
GLOBAL PARAMETERS			
Averaging Time - Carcinogen	yr	70	NYSDEC Interim Guidance, January 1997
Averaging Time - Noncarcinogen	yr	30	NYSDEC Interim Guidance, January 1997
Body Weight	kg	70	NYSDEC Interim Guidance, January 1997
Exposure Duration	yr	30	NYSDEC Interim Guidance, January 1997
Exposure Frequency	days/yr	350	NYSDEC Interim Guidance, January 1997
Soil ingestion rate	mg/day	10.2	NYSDEC Interim Guidance, January 1997
Daily Indoor Inhalation Rate	m^3/day	19.2	NYSDEC Interim Guidance, January 1997
Daily Outdoor Inhalation Rate	m^3/day	0.8	NYSDEC Interim Guidance, January 1997
Daily water ingestion rate	L/day	2	NYSDEC Interim Guidance, January 1997
Soil skin adherence factor	mg/cm^2	0.5	NYSDEC Interim Guidance, January 1997
Oral relative absorption factor	---	1	NYSDEC Interim Guidance, January 1997
Dermal relative absorption factor (volatiles)	---	0.5	NYSDEC Interim Guidance, January 1997
Dermal relative absorption factor (PAHs)	---	0.005	NYSDEC Interim Guidance, January 1997
Skin surface area	cm^2	1700	NYSDEC Interim Guidance, January 1997
Target Hazard Quotient for individual constituents	---	1	NYSDEC Interim Guidance, January 1997
Target Excess Individual Lifetime Cancer Risk	---	1.00E-06	NYSDEC Interim Guidance, January 1997
SOIL, BUILDING, SURFACE AND SUBSURFACE PARAMETERS			
Lower depth of surficial soil zone	cm	100	NYSDEC Interim Guidance, January 1997
Enclosed space air exchange rate	1/s	0.00014	NYSDEC Interim Guidance, January 1997
Fraction of organic carbon in soil	gm-C/gm-soil	0.00278	Site-specific
Thickness of capillary fringe	cm	5	NYSDEC Interim Guidance, January 1997
Thickness of vadose zone	cm	55.96	Site-specific
Infiltration rate of water through soil	cm/yr	13.97	NYSDEC Interim Guidance, January 1997
Enclosed space volume/infiltration area	cm	200	NYSDEC Interim Guidance, January 1997
Enclosed space foundation/wall thickness	cm	15	NYSDEC Interim Guidance, January 1997
Depth to groundwater	cm	60.96	Site-specific
Depth to subsurface impacted soil	cm	30.48	Site-specific
Particulate emission rate	g/cm^2-s	6.90E-14	NYSDEC Interim Guidance, January 1997
Wind speed above ground surface in ambient mixing zone	cm/s	225	NYSDEC Interim Guidance, January 1997
Groundwater Darcy velocity	cm/yr	2500	NYSDEC Interim Guidance, January 1997
Width of source area parallel to wind or gw flow	cm	1500	NYSDEC Interim Guidance, January 1997
Ambient air mixing zone height	cm	200	NYSDEC Interim Guidance, January 1997
Groundwater mixing zone height	cm	200	NYSDEC Interim Guidance, January 1997
Areal fraction of foundation/walls	cm^2/cm^2	0.001	NYSDEC Interim Guidance, January 1997
Volumetric air content in capillary fringe soils	cc/cc	0.038	equal to 10% of porosity
Volumetric air content in found./wall cracks	cc/cc	0.21	equal to air content in vadose zone soils
Volumetric air content in vadose zone soils	cc/cc	0.21	Site-specific
Total soil porosity	cc/cc-soil	0.38	Site-specific
Volumetric water content in capillary fringe soils	cc/cc	0.342	Site-specific
Volumetric water content in found./wall cracks	cc/cc	0.17	equal to water content in vadose zone soils
Volumetric water content in vadose zone soils	cc/cc	0.17	Site-specific
Soil bulk density	gm/cc	1.7	Site-specific
Averaging time for vapor flux	sec	9.46E+08	NYSDEC Interim Guidance, January 1997

Reference : Interim Procedures for Inactivation of Petroleum Impacted Sites, January 1997

TABLE 5-1(b)
RESIDENT CHILD - FUTURE CONDITIONS
EXPOSURE FACTORS AND OTHER RELEVANT PARAMETERS

EXPOSURE PARAMETER	Units	Value	Reference
GLOBAL PARAMETERS			
Averaging Time - Carcinogen	yr	70	NYSDEC Interim Guidance, January 1997
Averaging Time - Noncarcinogen	yr	6	NYSDEC Interim Guidance, January 1997
Body Weight	kg	15	NYSDEC Interim Guidance, January 1997
Exposure Duration	yr	6	NYSDEC Interim Guidance, January 1997
Exposure Frequency	days/yr	350	NYSDEC Interim Guidance, January 1997
Soil ingestion rate	mg/day	69.7	NYSDEC Interim Guidance, January 1997
Daily Indoor Inhalation Rate	m^3/day	9.1	NYSDEC Interim Guidance, January 1997
Daily Outdoor Inhalation Rate	m^3/day	0.9	NYSDEC Interim Guidance, January 1997
Soil skin adherence factor	mg/cm^2	0.5	NYSDEC Interim Guidance, January 1997
Oral relative absorption factor	—	1	NYSDEC Interim Guidance, January 1997
Dermal relative absorption factor (volatiles)	—	0.5	NYSDEC Interim Guidance, January 1997
Dermal relative absorption factor (PAHs)	—	0.005	NYSDEC Interim Guidance, January 1997
Skin surface area	cm^2	2100	NYSDEC Interim Guidance, January 1997
Target Hazard Quotient for individual constituents	—	1	NYSDEC Interim Guidance, January 1997
Target Excess Individual Lifetime Cancer Risk	—	1.00E-06	NYSDEC Interim Guidance, January 1997
SOIL, BUILDING, SURFACE AND SUBSURFACE PARAMETERS			
Lower depth of surficial soil zone	cm	100	NYSDEC Interim Guidance, January 1997
Enclosed space air exchange rate	1/s	0.00014	NYSDEC Interim Guidance, January 1997
Fraction of organic carbon in soil	gm-C/gm-soil	0.00278	ASTM - Guide for RBCA. November 1995
Thickness of capillary fringe	cm	5	NYSDEC Interim Guidance, January 1997
Thickness of vadose zone	cm	55.96	Site-specific
Infiltration rate of water through soil	cm/yr	13.97	ASTM - Guide for RBCA. November 1995
Enclosed space volume/infiltration area	cm	200	NYSDEC Interim Guidance, January 1997
Enclosed space foundation/wall thickness	cm	15	NYSDEC Interim Guidance, January 1997
Depth to groundwater	cm	60.96	Site-specific
Depth to subsurface impacted soil	cm	30.48	Site-specific
Particulate emission rate	g/cm^2-s	6.90E-14	ASTM - Guide for RBCA. November 1995
Wind speed above ground surface in ambient mixing zone	cm/s	225	ASTM - Guide for RBCA. November 1995
Groundwater Darcy velocity	cm/yr	2500	ASTM - Guide for RBCA. November 1995
Width of source area parallel to wind or gw flow	cm	1500	ASTM - Guide for RBCA. November 1995
Ambient air mixing zone height	cm	200	ASTM - Guide for RBCA. November 1995
Groundwater mixing zone height	cm	200	ASTM - Guide for RBCA. November 1995
Areal fraction of foundation/walls	cm^2/cm^2	0.001	NYSDEC Interim Guidance, January 1997
Volumetric air content in capillary fringe soils	cc/cc	0.038	equal to 10% of porosity
Volumetric air content in found./wall cracks	cc/cc	0.21	equal to air content in vadose zone soils
Volumetric air content in vadose zone soils	cc/cc	0.21	Site-specific
Total soil porosity	cc/cc-soil	0.38	Site-specific
Volumetric water content in capillary fringe soils	cc/cc	0.342	Site-specific
Volumetric water content in found./wall cracks	cc/cc	0.17	equal to water content in vadose zone soils
Volumetric water content in vadose zone soils	cc/cc	0.17	Site-specific
Soil bulk density	gm/cc	1.7	Site-specific
Averaging time for vapor flux	sec	1.89E+08	NYSDEC Interim Guidance, January 1997

Reference : Interim Procedures for Inactivation of Petroleum Impacted Sites, January 1997

TABLE 5-2
TIER 2 SITE-SPECIFIC TARGET LEVELS
AT BUILDING 205

Receptor	Media-Pathway	Concentration	Benzene	Napthalene	1,3,5-Trimethyl-benzene	1,2,4-Trimethyl-benzene
Future Resident (Adult)	Soil-Indoor Inhalation [mg/kg]	Tier 2 SSTL	**0.038**	**114**	**2.75**	**9.07**
		Site-specific Max	(0.18)	1.4	2	6.8
		Average	NA	0.64	1.1	2.9
	Groundwater-Indoor Inhalation [mg/L]	Tier 2 SSTL	**0.173**	**31**	**1.48**	**1.31**
		Site-specific Max	0.067	2.2	0.83	0.7
		Average	0.018	0.30	0.17	0.17
Future Residential (Child)	Soil-Indoor Inhalation [mg/kg]	Tier 2 SSTL	**0.086**	**78**	**1.24**	**4.1**
		Site-specific Max	(0.18)	1.4	(2)	(6.8)
		Average	NA	0.64	1.1	2.9
	Groundwater-Indoor Inhalation [mg/L]	Tier 2 SSTL	**0.39**	**21.8**	**0.67**	**0.59**
		Site-specific Max	0.067	2.2	(0.83)	(0.7)
		Average	0.018	0.30	0.17	0.17

( ) indicates value exceeds target level

Note: In some cases comparison with average not necessary since maximum does not exceed SSTLs

TABLE 5-3
SITE-SPECIFIC SOIL VAPOR TARGET LEVELS
AT BUILDING 205

Chemical	Henry's Constant	Molecular Weight	Soil Concentrations (SSTLs)		Soil Vapor Target Levels		Max. Plan "A" allowable vapor conc.‡
			wet wt.	dry wt.			
			[mg/kg]	[mg/kg]	[mg/l]	[ppm]	[ppm]
Benzene	5.58E-03	78.1	0.038	0.042	0.005	1.5	**3200**
Toluene	6.37E-03	92.1	1050	1174	43.4	11522	**3000**
Ethylbenzene	6.43E-03	106.2	3520	3935	40.7	9361	**2500**
Total Xylenes	7.04E-03	106.2	1021	1141	58.0	13350	**2500**
1,2,4-tri	2.33E-01	120.2	4.1	4.6	0.7	146	**2501**
1,3,5-tri	1.64E-01	120.2	1.24	1.4	0.6	118	**2502**
napthalene	4.90E-02	128	78	87.2	53.4	10197	**2503**
MTBE	4.16E-02	88.15	622	695	2111	585432	**2504**

* lowest of Tier 2 SSTLs

		Constituents	Koc	Kd
0.200	0.17 cc/cc	Benzene	83	1.94
0.180	0.21 cc/cc	Toluene	300	7.02
1.7	1.7 g/cc	Ethylbenzene	1100	25.7
0.0234	0.00278 (g/g)	Total Xylenes	240	5.62
		1,2,4-tri	2590	60.61

TABLE 5-4
SOIL VAPOR CONCENTRATIONS MEASURED AT BUILDING 205, PLATTSBURGH AFB

CHEMICAL	SOIL VAPOR SSTLS	BLANK	SOIL VAPOR CONCENTRATION					
		V-02-02-FB	V-01-02-AA	V-02-02-AA	V-03-02-AA	V-04-02-AA	V-05-02-AA	V-06-02-AA
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
MTBE	2.11E+09	10.0 U	44.0	10.0	320	54.0	10.0 U	10.0
Benzene	5.00E+03	3.0 U	14.0 U	5.0 U	130	9.0 U	9.0 U	8.0 U
Toluene	4.34E+07	10.0 U	55.0	26.0	470	66.0	55.0	44.0
Ethylbenzene	4.07E+07	10.0 U	13.0	10.0	65.0	17.0	15.0	11.0
Total Xylenes	5.80E+07	10.0 U	65.0	43.0	342	82.0	77.0	58.0
n-Propylbenzene	NA	10.0 U	10.0 U	10.0 U	16.0	10.0 U	10.0 U	10.0 U
1,3,5-Trimethylbenzene	6.00E+05	10.0 U	19.0	19.0	110	30.0	31.0	21.0
1,2,4-Trimethylbenzene	7.00E+05	10.0 U	10.0 U	13.0 U	97.0	20.0	21.0	12.0
Napthalene	5.34E+07	10.0 R	10.0 R	10.0 R	14.0 J	10.0 R	10.0 R	10.0 R

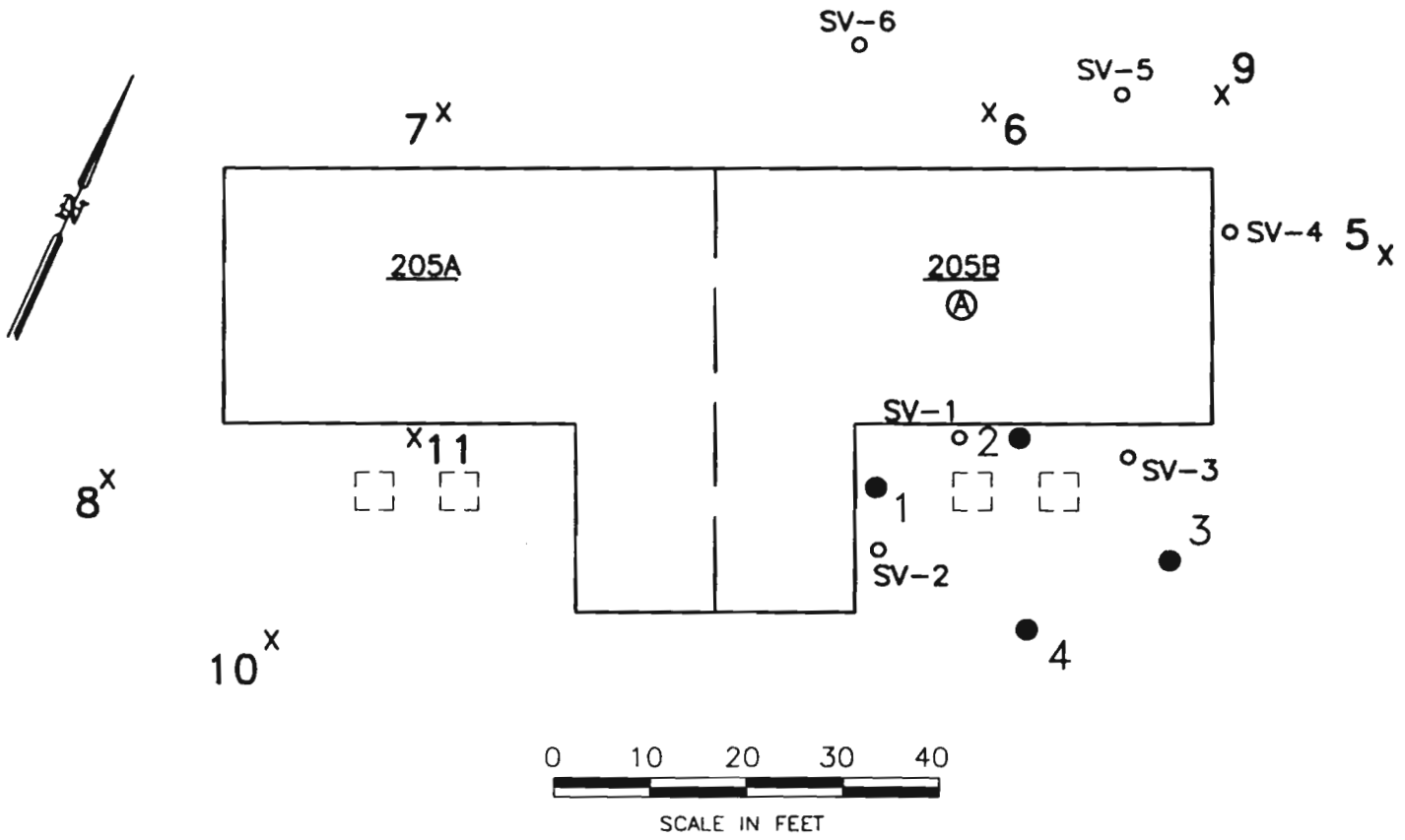
( ) exceed the target levels

TABLE 5-5
INDOOR AIR CONCENTRATIONS COMPARED TO TIER 1* INHALATION TARGET LEVELS AT BUILDING 205, PLATTSBURGH AFB

CHEMICAL	TIER 1 INDOOR AIR INHALATION TARGETS	AMBIENT AIR A-B1-FB		INDOOR AIR A-B1-AA	
	µg/m³	µg/m³		µg/m³	
MTBE	1480	1.01	U	4.88	J
Benzene	0.306	0.60		1.69	J
Toluene	189	1.01	U	5.38	J
Ethylbenzene	499	1.01	U	1.59	J
Total Xylenes	148	1.01	U	6.37	J
Isopropylbenzene	NA	1.01	U	1.00	UJ
n-Propylbenzene	NA	1.01	U	1.00	UJ
1,3,5-Trimethylbenzene	0.688	1.01	U	3.58	J
tert-Butylbenzene	NA	1.01	U	1.00	UJ
1,2,4-Trimethylbenzene	0.859	1.01	UJ	2.79	J
sec-Butylbenzene	NA	1.01	U	1.00	UJ
4-isopropyltoluene	NA	1.01	U	1.00	UJ
n-Butylbenzene	NA	1.01	U	1.00	UJ
Napthalene	5.16	1.01	R	2.19	J

exceed the target levels

APPENDIX C



LEGEND

- SCHEMATIC LOCATION OF FORMER TANKS
- GROUNDWATER FLOW DIRECTION UNKNOWN
- ● – LOCATION OF GROUNDWATER SAMPLE (OCT.–NOV. 1996)
- X – LOCATION OF GROUNDWATER SAMPLE (MAY 1997)
- Ⓐ – INDOOR AIR SAMPLE
- o SV-10 – LOCATION OF SOIL VAPOR BORINGS

REVISED: 7/31/98

Fanning, Phillips & Molnar
Engineers

FIGURE 2-1
SITE LOCATION AND SOIL VAPOR MEASUREMENT LOCATIONS
SITE 205
PLATTSBURGH AFB, N.Y.

CAD FILE No. SM1205B | DATE: 9/25/98

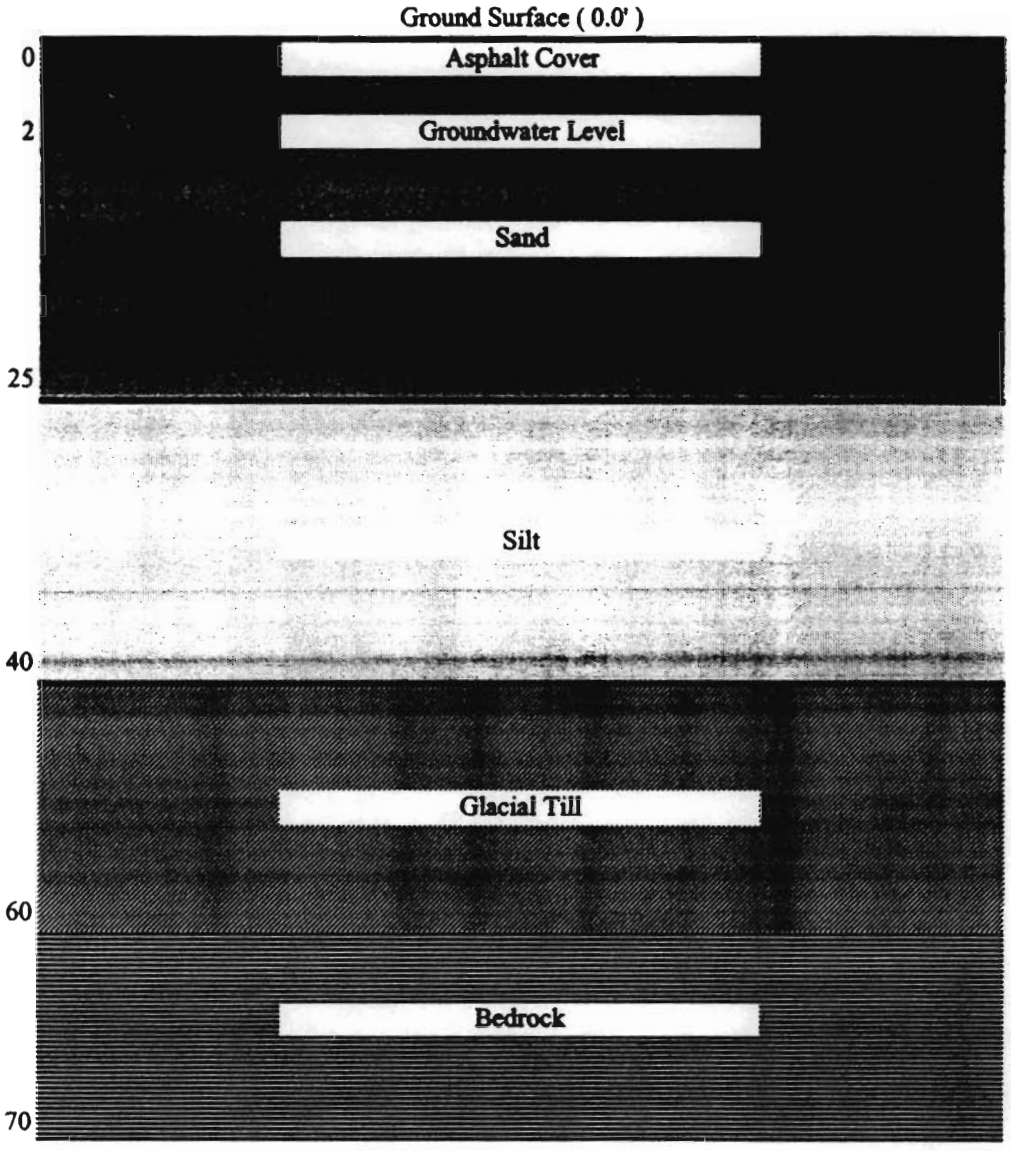


FIGURE 2-2. GENERALIZED SOIL PROFILE AT THE BUILDING 205

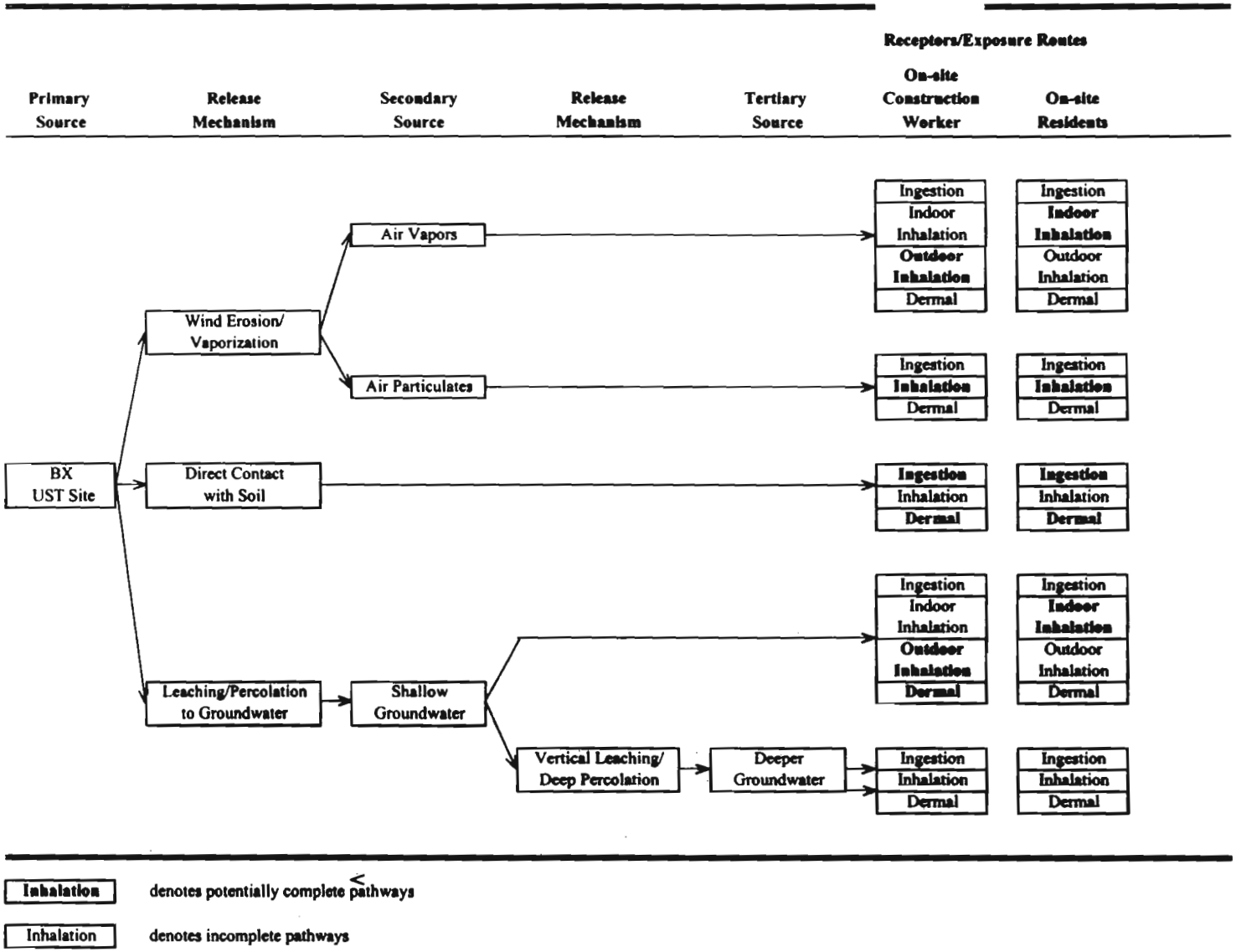


FIGURE 3-1. SITE CONCEPTUAL EXPOSURE MODEL FOR FUTURE CONDITIONS AT THE BUILDING 205

APPENDIX D

Fanning, Phillips and Molnar
Data Validation and Usability Report
Plattsburgh Air Force Base
Plattsburgh, New York
Final Indoor Air and Soil Vapor Surveys
FPM Project No. 444-96-01

Data Review
SDG No. FPM042

Laboratory:	**H2M Labs, Inc.**
Sample Matrix:	**air**
Number of Samples:	**10**
Analysis Performed:	**VOC (TCL or STARS)**
Data Reviewer:	**Joseph Camanzo, Senior Chemist**
Date:	**June 30, 1998**

This validation report pertains to the following samples:

Sample ID

P-7009-A-A2-AA
P-7009-A-A1-AA
P-205-A-B1-AA
P-864-A-A1-AA
P-864-A-B1-AA
P-828-A-A1-AA

QC Samples

Trip Blank (4/16/98)
P-7009-A-A1-FB (Field blank)
P-205-A-B1-FB (Field blank)
P-864-A-B1-FB (Field blank)

Deliverable

The above referenced Sample Delivery Group (SDG) was in a full data deliverable (CLP-like) data package format. The reporting format followed the requirements of the NYSDEC Analytical Service Protocol (ASP), Rev. 10/95. The data package contained backup QA/QC results and raw data to allow for a data validation review.

Analytical Method

The analytical test method used for the air samples was EPA Method T01/T02, Air and Gas Sorbent Tube Method, analyzed for EPA Target Compound List (TCL) or NYSDEC Spill Technology And Remediation Series (STARS) compounds.

Validation Guidance

The data was validated according to the protocols and QC requirements of the analytical method, U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review (revised in February 1994), USEPA Region II CLP Organics Data Review (May 1996), the Air Force Center for Environmental Excellence (AFCEE) Quality Assurance Project Plan (QAPP), Document Version 1.1 (dated February 1996), and the reviewer's professional judgement.

ORGANICS

The following QA/QC criteria were reviewed:

- Quantitation/detection limits
- Holding times
- GC/MS tuning and Performance
- Initial calibrations
- Continuing calibrations
- Method blanks
- Field and trip blanks
- Surrogate spike recoveries
- Internal standard area and retention times
- Data system printouts
- GC chromatograms and mass spectra
- Qualitative and quantitative compound identification
- Case narrative and deliverables compliance

The items listed above were in compliance with USEPA, ASP, and QAPP criteria and protocols with only exceptions discussed in the text below. The data have been validated according to the procedures outlined above and qualified accordingly.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (nondetect), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). The data for all flagged samples are usable with caution, except those with the "R", rejected, qualification.

It should be noted that in the case when the analytical laboratory may have already assigned data qualifiers (e.g., "J", "F", etc.) to some samples/analytical parameters based on internal QC reviews, the laboratory assigned qualifiers continue to apply in all instances that they were made unless expressly over-ridden by data validation flags.

VOLATILES

Data Validation Results

- For sample P-864-A-B1-FB analyzed for the STARS compound list, internal standard (IS) area counts (1,4-difluorobenzene) was below the lower QC limit of –50%. Additionally, the surrogate compound recovery (4-bromofluorobenzene) was above the QC limit at 167%, limit 80-120%. According to the laboratory, this may be a reflection that the sample tube leaked during the desorption, therefore the results are considered estimated with positive results flagged "J" and non-detects flagged "UJ'.

- For sample P-828-A-A1-AA analyzed for the TCL compound list, internal standard area counts for all three IS (bromochloromethane, 1,4-difluorobenzene, chlorobenzene-d5) were below the lower QC limit of –50%. Again according to the lab, this may have been due to a leak in the sample tube during desorption. Therefore, for this sample the results are considered estimated with positive results flagged "J" and non-detects flagged "UJ".

- The following table lists blanks, blank contaminants, concentrations (in ng), and associated samples. In accordance to the EPA National Functional guidelines, based on the concentration of these compounds in the blanks and associated samples, the presence of methylene chloride, acetone, and 2-butanone (common laboratory contaminants) are negated if the concentration in the samples is less than ten times the highest associated blank after taking sample dilution into account. The presence of the remaining compounds are negated in the samples if less than five times the concentration in the highest associated blank is found. The field blank samples (suffix –FB), which were ambient air samples taken outdoors in the vicinity of the buildings being evaluated (indoor air quality), were only used for qualitative purposes and not used to negate concentrations in associated samples. This was

decided because the purpose of these ambient air samples was to establish general background levels on the contaminants of concern.

Blank ID	Compound (Conc. in ng)	Associated Samples
Method Blank 4/21	Acetone (110)	All TCL compound analyses
Trip Blank (4/16/98)	Acetone (100B)	All TCL compound Analyses

- The following table lists compounds that: exhibited percent relative standard deviation (%RSD) for response factors in the initial (I) calibration above the 30% QC criteria; exhibited percent difference (%D) between the initial calibration and continuing (C) calibration response factors greater than the 25% criteria; exhibited response factors (RF) less than the 0.05 criteria. These criteria are based on the EPA National Functional guidelines. Associated sample results for these compounds are considered estimated with positive values flagged "J". For non-detects, %RSD or %D greater than the QC limits but less than 90% are flagged "UJ"; %RSD or %D greater than 90% or RF deficiencies (<0.05) are rejected and flagged "R".

Calibration	Compound	Deficiency	Associated Samples
I – 4/27/98	Naphthalene	%RSD=67.5	All STARS compound analyses
C – 4/28/98	Naphthalene	%D=-121.6	All STARS compound analyses
I – 2/10/98	Acetone	%RSD=40.9	All TCL compound analyses
	Methylene choride	%RSD=33.1	
	2-Butanone	%RSD=36.9	
	2-Hexanone	%RSD=52.3	
C – 4/21/98	Chloromethane	%D=39.0	All TCL compound analyses
	Acetone	%D=-29.4	
	1,1,2-Trichloroethane	%D=-26.4	
	4-Methyl-2-pentanone	%D=-70.9	
	Toluene	%D=-32.0	
	1,1,2,2-Tetrachloroethane	%D=-41.3	

- According to the laboratory, the shipping tube for sample P-202-A-B1-AA in which the sorbent tube is contained arrived broken at the lab. The sample tubes are sealed with

Swagelock fittings, however the shipping tubes serve as additional safeguard to prevent contamination by absorption from ambient air during transit. Therefore, the results from this sample are considered estimated with positive results flagged "J" and non-detects flagged "UJ".

Data Usability Results

Data review for usability is a process that evaluates the validated data in context to the original data quality objectives (DQOs). The formal process of usability determination involves a complex series of editing, screening, auditing, verifying, and reviewing the validated data. It is important to understand the bias associated with "J"-qualified data. The "J" data may have high, low, or indeterminate bias. A low bias means that the reported concentration is most likely an underestimate of the true concentration. For example, data may be biased low when sample holding times are exceeded or when the recovery of QA/QC compounds is significantly less than the true amount originally introduced into the sample. A high bias means that the reported concentration is most likely an overestimate of the true concentration. A bias is indeterminate when it is not possible to ascertain whether the concentration is an overestimate or an underestimate. For example, an indeterminate bias could result when matrix effects obscure QA/QC compounds.

Based on evaluation of all materials in this analytical data group, the data is highly usable with the data validation qualifiers as noted. There were only 4 rejected results (naphthalene non-detects) out of 245 total values in this SDG; therefore, as per the QAPP's completeness criteria (number of valid results/total number of possible results), the results were well above the 95% typical QC requirement.

SDG Summary

All data are valid and usable with qualifications as noted in the data review.

Signed: Joseph Canary

Dated: 7/2/98

ATTACHMENTS

- Chain-of-Custody
- Laboratory SDG Case Narrative
- Definition of Data Validation Qualifiers (USEPA)
- Definition of AFCEE QAPP Data Qualifiers
- Definition of Lab Qualifiers
- Qualified Results on Lab Form 1s

DATA VALIDATION QUALIFIERS (USEPA)

Organics

U - The analyte was analyzed for, but not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

AFCEE QAPP Data Qualifiers

Qualifier	Description
J	The analyte was positively identified, the quantitation is an estimation.
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
F	The analyte was positively identified but the associated numerical value is below the RL.
R	The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.
B	The analyte was found in an associated blank, as well as in the sample.
M	A matrix effect was present.
S	To be applied to all field screening data.
T	Tentatively identified compound (using GC/MS).

1/4 Incl SDG#32

AFCEE
CHAIN OF CUSTODY RECORD

COC#: _____

Sample Receiving
H2M Labs, Inc.
575 Broad Hollow Road
Melville, NY 11747

Ship to:	Project Name: Plattsburgh AFB	Send Results to: G Menezo FPM 909 Marconi Pontoonka, NJ 11779
	Sampler Name: Menezo	
Carrier: Airbill #:	Sampler Signature:	

Field Sample ID	Date 1998	Time	Matrix	Pres	Filtered /Unfilt.	# of Containers	MS/ MSD	Analyses Requested: VOCs										Comments
Trip Blank	4/16	1240	A	—	—	1	—	1	VOC							5551		
P-7009-A-A2-AA		12:40	A	—	—	1		1✓	TCL	2		C				5552		
P-7009-A-A1-FB		13:15	A	—	—	1		1	TCL	3						5553		
P-205-A-B1-AA		13:45	A	—	—	1		1	STAR	4						5554		
P-205-A-B1-FB		15:00	A	—	—	1		1	STAR	5						5555		
P-7009-A-A1-AA		13:15	A	—	—	1		1	TCL	6						5560		
P-864-A-A1-AA		16:30	A	—	—	1		1	STAR	7						5561		
P-864-A-B1-FB		16:45	A	—	—	1		1	STAR	8						5562		
P-864-A-B1-AA		16:45	A	—	—	1		1	STAR	9						5563		
P-828-A-A1-AA		17:15	A	—	—	1		1	TCL	10						5564		

Sample Condition Upon Receipt at Laboratory: Cooler temperature:

Special Instructions/Comments:

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date: 4/16/98	#3 Released by: (Sig)	Date:
Company Name:	Time	Company Name: FPM	Time 1800	Company Name:	Time
#1 Received by: (Sig)	Date 4/16/98	#2 Received by: (Sig)	Date	#3 Received by: (Sig)	Date 4-17-98
Company Name: FPM	Time: 1800	Company Name:	Time:	Company Name: H2M	Time 1100

SAMPLES WERE:
1. Shipped ✓ or Hand Delivered ___ Airbill # 5x 12x 21
2. Ambient ___ or Chilled ✓ 2° °C 6 x 4
3. Received in good condition Y ✓ N ___
4. Properly preserved Y ✓ N ___
5. Discrepancies between sample labels & COC Record Y ___ N ✓

COC TAPE WAS:
1. Present on outer package Y ✓ N ___

H2M LABS, INC.

SDG NARRATIVE FOR VOLATILES IN AIR ANALYSES
SAMPLES RECEIVED: 4/17/98
SDG #: FPM042

For Samples:

TRIP BLANK	P-7009-A-A1-AA
P-7009-A-A2-AA	P-864-A-A1-AA
P-7009-A-A1-FB	P-864-A-B1-FB
P-205-A-B1-AA	P-864-A-B1-AA
P-205-A-B1-FB	P-828-A-A1-AA

The samples were analyzed according to EPA Methods TO1 / TO2, and the reporting format follows the requirements of the NYSDEC Analytical Service Protocol (ASP), Rev. 10/95.

The samples were reported for either the TCL compounds or the STAR compounds, as requested.

QC DATA

The surrogate and internal standard for tube P-864-A-B1-FB were not within the QC limits,and the internal standards were low in sample P-828-A-A1-AA. This could indicate that the tubes leaked during desorption.

It appears likely that a spare tube from the sampling was used to analyze the instrument ("method") blank on 4/21/98, which would explain the amount of acetone found, which is unusually high. (Acetone was found in the trip blank) Other days show much lower levels of acetone background in the instrument.

Compounds found in the method blanks were flagged with the qualifier "B" in the associated samples, i.e. run on the same day as the blank.

TUNING

Even though no tune criteria are set in methods TO-1 / TO-2, mass calibration (tuning) was checked with BFB against standard EPA acceptance criteria ✓

CALIBRATION FOR TARGETED ANALYTES

Multipoint calibration at three concentration levels from 10 to 1000 ng was performed with internal standard calibration, using three internal standards for the TCL compounds. For calibration of the STAR analytes, 1,4-difluorobenzene was used as internal standard.

SAMPLE ANALYSES

The shipping tube for sample P-205-A-B1-AA, in which the sorbent tube is contained, arrived broken. Sorbent tubes are sealed with Swagelock fittings, and shipping tubes serve as additional safeguard to prevent contamination by absorption from the ambient air.

H2M LABS, INC.

SDG NARRATIVE FOR VOLATILES IN AIR ANALYSES
SAMPLES RECEIVED: 4/17/98
SDG #: FPM042

Estimated values, indicated by the qualifier "J", are reported for the two samples with low internal standard areas.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Date Reported: May 14, 1998

****
* *
* *
****

Ursula Middel
Technical Manager

H2M LABS, INC.

QUALIFIERS FOR REPORTING ORGANICS DATA

Value - If the result is a value greater than or equal to the quantification limit, report the value.

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to

$$\frac{(330\ U) \times df}{D} \quad \text{where } D = \frac{100 - \%\ \text{moisture}}{100}$$

and df = dilution factor

For example, at 24% moisture, $D = \frac{100-24}{100} = 0.76$

$$\frac{(330\ U) \times 10}{.76} = 4300\ U$$ rounded to the appropriate number of significant figures

For semivolatile soil samples, the extract must be concentrated to 0.5 mL, and the sensitivity of the analysis is not compromised by the cleanup procedures. Similarly, pesticide samples subjected to GPC are concentrated to 5.0 mL. Therefore, the CRQL values in Exhibit C will apply to all samples, regardless of cleanup. However, if a sample extract cannot be concentrated to the protocol-specified volume (see Exhibit C), this fact must be accounted for in reporting the sample quantitation limit.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified quantification limit but greater than zero. (e.g.: If limit of quantification is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.) The sample quantitation limit must be adjusted for dilution as discussed for the U flag.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P"

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a Laboratory-defined flag, discussed below

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of the peak representing the single isomer exceeds 200 ug/l or the peak representing the two coeluting isomers on that GC column exceeds 400 ug/l. Similarly, if the two 1,2-Dichloroethene isomers coelute, a diluted analysis is not required unless the concentration exceeds 400 ug/l.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine "A", "B", and "D" flags for some samples. The Laboratory defined flags limited to the letters "X", "Y" and "Z"

The combination of flags "BU" or "UB" is expressly prohibited. Blank contaminants are flagged "B" only when they are detected in the sample.

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
TRIP BLANK

MATRIX : AIR

Sample ID. : 9811555 5996 4/21/98
Lab File ID : V3498.D
Date/Time Analyzed: 04/21/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane	10	U	J
Vinyl Chloride	10	U	
Bromomethane	10	U	
Chloroethane	10	U	
1,1-Dichloroethene	10	U	
Acetone	100	B	J
Carbon Disulfide	10	U	
Methylene Chloride	10	U	J
2-Butanone	10	U	J
trans-1,2-Dichloroethene	10	U	
cis-1,2-1,2-Dichloroethene	10	U	
1,1-Dichloroethane	10	U	
Chloroform	10	U	
1,2-Dichloroethane	10	U	
1,1,1-Trichloroethane	10	U	
Carbon Tetrachloride	10	U	
Trichloroethene	10	U	
Benzene	3	U	
1,2-Dichloropropane	10	U	
Bromodichloromethane	10	U	
cis-1,3-Dichloropropene	10	U	
trans-1,3-Dichloropropene	10	U	
1,1,2-Trichloroethane	10	U	J
4-Methyl-2-Pentanone	10	U	J
2-Hexanone	10	U	J
Toluene	10	U	J
Tetrachloroethene	10	U	
Dibromochloromethane	10	U	
Chlorobenzene	10	U	
Ethylbenzene	10	U	
Xylene (total)	10	U	
Styrene	10	U	
Bromoform	10	U	
1,1,2,2-Tetrachloroethane	10	U	J

5/12/98

6/15/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P7009AA2AA

MATRIX : AIR

Sample ID. : 9811556 5996 4/21/98
Lab File ID : V3499.D
Date/Time Analyzed: 04/21/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng		
Chloromethane	10	U	J	
Vinyl Chloride	10	U		
Bromomethane	10	U		
Chloroethane	10	U		
1,1-Dichloroethene	10	U		
Acetone	1,000	~~EB~~	~~J~~	
Carbon Disulfide	10	U		
Methylene Chloride	580	J		
2-Butanone	130	J		
trans-1,2-Dichloroethene	10	U		
cis-1,2-1,2-Dichloroethene	10	U		
1,1-Dichloroethane	10	U		
Chloroform	10	U		
1,2-Dichloroethane	10	U		
1,1,1-Trichloroethane	10	U		
Carbon Tetrachloride	10	U		
Trichloroethene	10	U		
Benzene	12			
1,2-Dichloropropane	10	U		
Bromodichloromethane	10	U		
cis-1,3-Dichloropropene	10	U		
trans-1,3-Dichloropropene	10	U		
1,1,2-Trichloroethane	10	U	J	
4-Methyl-2-Pentanone	10	U	J	
2-Hexanone	10	U	J	
Toluene	22	J		
Tetrachloroethene	10	U		
Dibromochloromethane	10	U		
Chlorobenzene	10	U		
Ethylbenzene	10	U		
Xylene (total)	10	U		
Styrene	10	U		
Bromoform	10	U		
1,1,2,2-Tetrachloroethane	10	U	J	

5/12/98

6/15/98

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P7009AA1FB

MATRIX : AIR

Sample ID. : 9811557 5996 4/21/98
Lab File ID : V3500.D
Date/Time Analyzed: 04/21/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result : ng	
Chloromethane	16	
Vinyl Chloride	10	U
Bromomethane	10	U
Chloroethane	10	U
1,1-Dichloroethene	10	U
Acetone	450	
Carbon Disulfide	10	U
Methylene Chloride	1,100	E
2-Butanone	81	
trans-1,2-Dichloroethene	10	U
cis-1,2-1,2-Dichloroethene	10	U
1,1-Dichloroethane	10	U
Chloroform	10	U
1,2-Dichloroethane	10	U
1,1,1-Trichloroethane	10	U
Carbon Tetrachloride	10	U
Trichloroethene	10	U
Benzene	7	
1,2-Dichloropropane	10	U
Bromodichloromethane	10	U
cis-1,3-Dichloropropene	10	U
trans-1,3-Dichloropropene	10	U
1,1,2-Trichloroethane	10	U
4-Methyl-2-Pentanone	10	U
2-Hexanone	10	U
Toluene	17	
Tetrachloroethene	10	U
Dibromochloromethane	10	U
Chlorobenzene	10	U
Ethylbenzene	10	U
Xylene (total)	10	U
Styrene	10	U
Bromoform	10	U
1,1,2,2-Tetrachloroethane	10	U

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P7009AA1AA

MATRIX : AIR

Sample ID. : 9811560 5996 4/21/98
Lab File ID : V3501.D
Date/Time Analyzed: 04/21/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng		
Chloromethane		10	U	J
Vinyl Chloride		10	U	
Bromomethane		10	U	
Chloroethane		10	U	
1,1-Dichloroethene		10	U	
Acetone		1,000	~~50~~ U J	
Carbon Disulfide		10	U	
Methylene Chloride		310	J	
2-Butanone		120		J
trans-1,2-Dichloroethene		10	U	
cis-1,2-1,2-Dichloroethene		10	U	
1,1-Dichloroethane		10	U	
Chloroform		10	U	
1,2-Dichloroethane		10	U	
1,1,1-Trichloroethane		10	U	
Carbon Tetrachloride		10	U	
Trichloroethene		10	U	
Benzene		10		
1,2-Dichloropropane		10	U	
Bromodichloromethane		10	U	
cis-1,3-Dichloropropene		10	U	
trans-1,3-Dichloropropene		10	U	
1,1,2-Trichloroethane		10	U	
4-Methyl-2-Pentanone		10	U	
2-Hexanone		10	U	
Toluene		24		
Tetrachloroethene		10	U	
Dibromochloromethane		10	U	
Chlorobenzene		10	U	
Ethylbenzene		10	U	
Xylene (total)		10	U	
Styrene		10	U	
Bromoform		10	U	
1,1,2,2-Tetrachloroethane		10	U	J

5/12/98

6/15/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
~~Converted from R~~
P823AA1AA

MATRIX : AIR

Sample ID. : 9811564 5996 4/21/98
Lab File ID : V3502.D
Date/Time Analyzed: 04/21/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result : ng	
Chloromethane	10	U
Vinyl Chloride	10	U
Bromomethane	10	U
Chloroethane	10	U
1,1-Dichloroethene	10	U
Acetone	2,900	EB J
Carbon Disulfide	10	U
Methylene Chloride	400	J
2-Butanone	200	J
trans-1,2-Dichloroethene	10	U
cis-1,2-1,2-Dichloroethene	10	U
1,1-Dichloroethane	10	U
Chloroform	10	U
1,2-Dichloroethane	10	U
1,1,1-Trichloroethane	10	U
Carbon Tetrachloride	10	U
Trichloroethene	10	U
Benzene	18	J
1,2-Dichloropropane	10	U
Bromodichloromethane	10	U
cis-1,3-Dichloropropene	10	U
trans-1,3-Dichloropropene	10	U
1,1,2-Trichloroethane	10	U
4-Methyl-2-Pentanone	10	U
2-Hexanone	10	U
Toluene	150	J
Tetrachloroethene	12	J
Dibromochloromethane	10	U
Chlorobenzene	10	U
Ethylbenzene	10	U
Xylene (total)	10	U
Styrene	10	U
Bromoform	10	U
1,1,2,2-Tetrachloroethane	10	U

J
5/14/98
6/15/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P205A-B1AA

MATRIX : AIR

Sample ID. : 9811558 5996 4/28/98
Lab File ID : V3537.D
Date/Time Analyzed: 04/28/19 -1:5:
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Methyl t-butyl ether		49	
Benzene		17	
Toluene		54	
Ethylbenzene		16	
o-Xylene		17	
m/p-Xylene		47	
Isopropylbenzene		10	U
1,3,5-trimethylbenzene		36	
1,2,4-Trimethylbenzene		28	
n-Propylbenzene		10	U
t-Butylbenzene		10	U
sec-Butylbenzene		10	U
4-isopropyltoluene		10	U
n-Butylbenzene		10	U
Napthalene		22	J

J

6/15/98

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P205A-B1FB

MATRIX : AIR

Sample ID. : 9811559 5996 4/28/98
Lab File ID : V3538.D
Date/Time Analyzed: 04/28/19 -1:6:
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng		
Methyl t-butyl ether		10	U	
Benzene		6		
Toluene		10	U	
Ethylbenzene		10	U	
o-Xylene		10	U	
m/p-Xylene		10	U	
Isopropylbenzene		10	U	
1,3,5-trimethylbenzene		10	U	
1,2,4-Trimethylbenzene		10	U	J
n-Propylbenzene		10	U	
t-Butylbenzene		10	U	
sec-Butylbenzene		10	U	
4-isopropyltoluene		10	U	
n-Butylbenzene		10	U	
Napthalene		10	U	R

6/15/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P864A-A1AA

MATRIX : AIR

Sample ID. : 9811561 5996 4/28/98
Lab File ID : V3539.D
Date/Time Analyzed: 04/28/19 -1:6:
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Methyl t-butyl ether		10	U
Benzene		9	
Toluene		15	
Ethylbenzene		10	U
o-Xylene		10	U
m/p-Xylene		10	U
Isopropylbenzene		10	U
1,3,5-trimethylbenzene		10	U
1,2,4-Trimethylbenzene		10	U J
n-Propylbenzene		10	U
t-Butylbenzene		10	U
sec-Butylbenzene		10	U
4-isopropyltoluene		10	U
n-Butylbenzene		10	U
Napthalene		10	U R

jr 6/15/98

A 0048

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P864A-B1FB

MATRIX : AIR

Sample ID. : 9811562 5996 4/28/98
Lab File ID : V3540.D
Date/Time Analyzed: 04/28/19 -1:7:
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Methyl t-butyl ether		10	U
Benzene		22	J
Toluene		20	J
Ethylbenzene		10	U
o-Xylene		10	U
m/p-Xylene		10	U
Isopropylbenzene		10	U
1,3,5-trimethylbenzene		10	U
1,2,4-Trimethylbenzene		10	U
n-Propylbenzene		10	U
t-Butylbenzene		10	U
sec-Butylbenzene		10	U
4-isopropyltoluene		10	U
n-Butylbenzene		10	U
Napthalene		10	UR

5/14

JC
6/15/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P864A-B1AA

MATRIX : AIR

Sample ID. : 9811563 5996 4/28/98
Lab File ID : V3541.D
Date/Time Analyzed: 04/28/19 -1:7:
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Methyl t-butyl ether		10	U
Benzene		8	
Toluene		15	
Ethylbenzene		10	U
o-Xylene		10	U
m/p-Xylene		10	U
Isopropylbenzene		10	U
1,3,5-trimethylbenzene		10	U
1,2,4-Trimethylbenzene		10	U J
n-Propylbenzene		10	U
t-Butylbenzene		10	U
sec-Butylbenzene		10	U
4-isopropyltoluene		10	U
n-Butylbenzene		10	U
Napthalene		10	U R

6/15/98

A 0056

Fanning, Phillips and Molnar
Data Validation and Usability Report
Plattsburgh Air Force Base
Plattsburgh, New York
Final Indoor Air and Soil Vapor Surveys
FPM Project No. 444-96-01

Data Review
SDG No. FPM041

Laboratory:	**H2M Labs, Inc.**
Sample Matrix:	**soil vapor**
Number of Samples:	**20**
Analysis Performed:	**VOC (TCL or STARS)**
Data Reviewer:	**Joseph Camanzo, Senior Chemist**
Date:	**June 30, 1998**

This validation report pertains to the following samples:

Sample ID

P-9400-V-02-02-AA	P-2335-V-12-02-AA	P-205-V-02-02-AA
P-9400-V-04-02-AA	P-2335-V-10-02-AA	P-205-V-01-02-AA
P-9400-V-03-02-AA	P-2335-V-11-02-AA	P-205-V-03-02-AA
P-9400-V-01-02-AA	P-2335-V-09-02-AA	P-205-V-04-02-AA
P-9400-V-06-02-AA		P-205-V-05-02-AA
		P-205-V-06-02-AA

QC Samples

P-9400-V-02-02-TB (Trip blank)
P-9400-V-02-02-FB (Field blank)
P-2335-V-12-02-TB (Trip blank)
P-2335-V-11-02-FB (Field blank)
P-205-V-02-02-FB (Field blank)

Deliverable

The above referenced Sample Delivery Group (SDG) was in a full data deliverable (CLP-like) data package format. The reporting format followed the requirements of the NYSDEC Analytical Service Protocol (ASP), Rev. 10/95. The data package contained backup QA/QC results and raw data to allow for a data validation review.

Analytical Method

The analytical test method used for the soil vapor samples was EPA Method 5041, Volatile Organic Sampling Trains (VOST); samples were analyzed for EPA Target Compound List (TCL) or NYSDEC Spill Technology And Remediation Series (STARS) compounds.

Validation Guidance

The data was validated according to the protocols and QC requirements of the analytical method, U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review (revised in February 1994), USEPA Region II CLP Organics Data Review (May 1996), the Air Force Center for Environmental Excellence (AFCEE) Quality Assurance Project Plan (QAPP), Document Version 1.1 (dated February 1996), and the reviewer's professional judgement.

ORGANICS

The following QA/QC criteria were reviewed:

- Quantitation/detection limits
- Holding times
- GC/MS tuning and Performance
- Initial calibrations
- Continuing calibrations
- Method blanks
- Field and trip blanks
- Surrogate spike recoveries
- Internal standard area and retention times
- Data system printouts
- GC chromatograms and mass spectra
- Qualitative and quantitative compound identification
- Case narrative and deliverables compliance

The items listed above were in compliance with USEPA, ASP, and QAPP criteria and protocols with only exceptions discussed in the text below. The data have been validated according to the procedures outlined above and qualified accordingly.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (nondetect), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). The data for all flagged samples are usable with caution, except those with the "R", rejected, qualification.

It should be noted that in the case when the analytical laboratory may have already assigned data qualifiers (e.g., "J", "F", etc.) to some samples/analytical parameters based on internal QC reviews, the laboratory assigned qualifiers continue to apply in all instances that they were made unless expressly over-ridden by data validation flags.

VOLATILES

Data Validation Results

- For sample P-9400-V-02-02-AA analyzed for the STARS compound list, no surrogate compound recovery (4-bromofluorobenzene) or internal standard area (1,4-difluorobenzene) could be reported. According to the laboratory, this sample was obviously skipped by the automated spiking apparatus. Since this event resulted in a lack of QC data, and the concentrations in the sample had to be determined using the external method of calculation, the results are considered estimated with positive results flagged "J" and non-detects flagged "UJ".

- The following table lists blanks, blank contaminants, concentrations (in ng), and associated samples. In accordance to the EPA National Functional guidelines, based on the concentration of these compounds in the blanks and associated samples, the presence of methylene chloride, acetone, and 2-butanone (common laboratory contaminants) are negated if the concentration in the samples is less than ten times the highest associated blank after taking sample dilution into account. The presence of the remaining compounds are negated in the samples if less than five times the concentration in the highest associated blank is found. The field blank samples (suffix –FB), which were ambient air samples taken in the vicinity of the VOST soil vapor samples, were only used for qualitative purposes and not used to negate concentrations in associated samples. This was decided based on the fact that the VOST sampling device is a closed system and that the soil vapor samples taken at a depth of 2 feet have no direct relation to the ambient air at the sampling locations.

Blank ID	Compound (Conc. in ng)	Associated Samples
Method Blank 5/1	Acetone (22)	All TCL compound analyses
P-2335-V-12-02-TB	Methylene chloride (16) Benzene (3)	All TCL compound Analyses
P-9400-V-02-02-TB	Benzene (6)	All STARS compound analyses

- The following table lists compounds that: exhibited percent relative standard deviation (%RSD) for response factors in the initial (I) calibration above the 30% QC criteria; exhibited percent difference (%D) between the initial calibration and continuing (C) calibration response factors greater than the 25% criteria; exhibited response factors (RF) less than the 0.05 criteria. These criteria are based on the EPA National Functional guidelines. Associated sample results for these compounds are considered estimated with positive values flagged "J". For non-detects, %RSD or %D greater than the QC limits but less than 90% are flagged "UJ"; %RSD or %D greater than 90% or RF deficiencies (<0.05) are rejected and flagged "R".

Calibration	Compound	Deficiency	Associated Samples
I – 4/30/98	Naphthalene	%RSD=122	All STARS compound analyses by internal standard method
I – 5/14/98	Naphthalene	%RSD=120.6	P-9400-V-02-02-AA, by external method
I – 3/26/98	Vinyl chloride Chloroethane Bromoform	%RSD=38.5 %RSD=44.8 %RSD=32.0	All TCL compound analyses
C – 5/01/98	Vinyl chloride 2-Butanone	%D=-26.0 %D=33.1	All TCL compound analyses

- According to the laboratory manager, instrument problems were experienced during the analysis of sample P-205-V-03-02-AA and no data can be reported.

Data Usability Results

Data review for usability is a process that evaluates the validated data in context to the original data quality objectives (DQOs). The formal process of usability determination involves a complex series of editing, screening, auditing, verifying, and reviewing the validated data. It is important to understand the bias associated with "J"-qualified data. The "J" data may have high, low, or indeterminate bias. A low bias means that the reported concentration is most likely an underestimate of the true concentration. For example, data may be biased low when sample holding times are exceeded or when the recovery of QA/QC compounds is significantly less than the true amount originally introduced into the sample. A high bias means that the reported concentration is most likely an overestimate of the true concentration. A bias is indeterminate when it is not possible to ascertain whether the concentration is an overestimate or an underestimate. For example, an indeterminate bias could result when matrix effects obscure QA/QC compounds.

Based on evaluation of all materials in this analytical data group, the data is highly usable with the data validation qualifiers as noted. There were only 11 rejected results (naphthalene non-detects) out of 399 total values in this SDG; therefore, as per the QAPP's completeness criteria (number of valid results/total number of possible results), the results were well above the 95% typical QC requirement.

SDG Summary

All data are valid and usable with qualifications as noted in the data review.

Signed: _____

Dated: 7/2/98

ATTACHMENTS

- Chain-of-Custody
- Laboratory SDG Case Narrative
- Definition of Data Validation Qualifiers (USEPA)
- Definition of AFCEE QAPP Data Qualifiers
- Definition of Lab Qualifiers
- Qualified Results on Lab Form 1s

DATA VALIDATION QUALIFIERS (USEPA)

Organics

U - The analyte was analyzed for, but not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

AFCEE QAPP Data Qualifiers

Qualifier	Description
J	The analyte was positively identified, the quantitation is an estimation.
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
F	The analyte was positively identified but the associated numerical value is below the RL.
R	The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.
B	The analyte was found in an associated blank, as well as in the sample.
M	A matrix effect was present.
S	To be applied to all field screening data.
T	Tentatively identified compound (using GC/MS).

CUSTODY SEAL Signature

SDG # 32

AFCEE
CHAIN OF CUSTODY RECORD

COC#: _____

Sample Receiving
H2M Labs, Inc.
575 Broad Hollow Road
Melville, NY 11747

Ship to:	Project Name: Plattsburgh AFB	Send Results to: G. Menegio FPM 909 Marconi Ave Ronkonkoma, NY 11779
Carrier: FEDEX Airbill #:	Sampler Name: Greg Menegio	
	Sampler Signature:	

PUSTAR

Field Sample ID	Date 1998 4/15	Time	Matrix	Pres	Filtered /Unfilt.	# of Containers	MS/ MSD	Analyses Requested: VOCs											Comments
P-9400-V-02-02AA		1700	A	-	-	2	-	2		STAR		1			9811	525			
P-9400-V-02-02TB		1500	A	-	-	2	-	2				2				526			
P-9400-V-02-02-FB		1600	A	-	-	2	-	2				3				527			
P-9400-V-04-02AA		1730	A	-	-	2	-	2				4				528			
P-9400-V-03-02AA		1800	A	-	-	2	-	2				5				529			X(TC)
P-9400-V-01-02-AA		1830	A	-	-	2	-	2				6				530			X(T+TC)
P-9400-V-05-02AA		1900	A	-	-	2	-	2		↓		7				531			X(T)
06	KEK	4/17/98																	TIC Tube broken

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Sample Condition Upon Receipt at Laboratory:	Cooler temperature:
Special Instructions/Comments: DO NOT Dilute Samples - RUN & Report low level (and Medium level if nec) CONTACT CLIENT IF PROBLEM	

#1 Relinquished by: (Sig)	Date:	#2 Relinquished by: (Sig) Lisa	Date: 4/16/98	#3 Relinquished by: (Sig)	Date
Company Name:	Time	Company Name: FPM	Time 1800	Company Name:	Time
#1 Received by: (Sig) Lisa	Date 4/16/98	#2 Received by: (Sig)	Date	#3 Received by: (Sig)	Date 4-17-98
Company Name: FPM	Time: 1000	Company Name:	Time:	Company Name: H2M	Time 11:00

SAMPLES WERE:
1. Shipped ___ or Hand Delivered ___ Airbill # 803514 1
2. Ambient ___ or Chilled ✓ 2.6 °C 03483
3. Received in good condition Y ✓ N ___
4. Properly preserved Y ✓ N ___
5. Discrepancies between sample labels & COC Record Y ___ N ___
COC TAPE WAS:
1. Present on outer package Y ___ N ___

8003

1/2

AFCEE
CHAIN OF CUSTODY RECORD

SDG 32

COC#: _____

Ship to: Sample Receiving H2M Labs, Inc. 575 Broad Hollow Road Melville, NY 11747 Carrier:	Project Name: Plattsburgh AFB Sampler Name: G. Menegio Sampler Signature:	Send Results to: G. Menegio FPM 909 Marconi Ave Ronkonkoma, NY 11779

Field Sample ID	Date 1998	Time	Matrix	Preserved	Filtered /Unfilt.	# of Containers	MS/ MSD	Analyses Requested: VOCs											Comments
P-2335-V-02-02-TB	4/16	0900	A	-	-	2	-	2	TCL	8		9	8	11	53	2			
P-2335-V-12-02-AA		0930	A	-	-	2	-	2	TCL	9					53	3			
P-2335-V-10-02-AA		1000	A	-	-	2	-	2	TCL	10					53	4			
P-2335-V-11-02-FB		1000	A	-	-	2	-	2	TCL	11					53	5			
P-2335-V-11-02-AA		1000	A	-	-	2	-	2	TCL	12					53	6			X(TCL)
P-2335-V-09-02-AA		1050	A	-	-	2	-	2	TCL	13					53	7			X(T)
P-205-V-02-02-FB		1330	A	-	-	2	-	2	STAR	14					53	8			
P-205V-02-02-AA		1330	A	-	-	2	-	2	STAR	15					53	9			

Sample Condition Upon Receipt at Laboratory: Cooler temperature:

Special Instructions/Comments:

#1 Released by: (Sig)		Date:		#2 Released by: (Sig)		Date: 4/16/98		#3 Released by: (Sig)		Date:	
Company Name:		Time		Company Name:	FPM	Time 1800		Company Name:		Time	
#1 Received by: (Sig)		Date 4/16/98		#2 Received by: (Sig)		Date		#3 Received by: (Sig)		Date 4-17-98	
Company Name:	FPM	Time: 1000		Company Name:		Time:		Company Name:	H2O	Time 1110	

2/2

SDG 32

AFCEE
CHAIN OF CUSTODY RECORD

COC#: _____

Ship to: Sample Receiving H2M Labs, Inc. 575 Broad Hollow Road Melville, NY 11747 Carrier: E	Project Name: Plattsburgh AFB Sampler Name: C. Menezes Sampler Signature:	Send Results to: C Menezes FPM 909 Marconi Ave Ronkonkoma, NY 11779

Field Sample ID	Date 1998 4/16	Time	Matrix	Pres	Filtered /Unfilt.	# of Containers	MS/ MSD	Analyses Requested: VOCs											Comments
P-205-V-02-02-AA		1400	A	-	-	2	-	2	STAR	16			9811540						
P-205-V-03-02-AA		1430	A	-	-	2	-	2	STAR	17			541						X(T)
P-205-V-04-02-AA		1500	A	-	-	2	-	2	STAR	18			542						
P-205-V-05-02-AA		1530	A	-	-	2	-	2	STAR	19			543						X(T+TC)
P-205-V-06-02-AA		1600	A	-	-	2	-	2	STAR	20			544						

Sample Condition Upon Receipt at Laboratory: Cooler temperature:

Special Instructions/Comments:

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date:	#3 Released by: (Sig)	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
#1 Received by: (Sig)	Date 4/16/98	#2 Received by: (Sig)	Date 4/16/98	#3 Received by: (Sig)	Date 4-17-98
Company Name: FPM	Time: 1000	Company Name: FPM	Time: 1800	Company Name: H2M	Time 1100

0005

H2M LABS, INC.

SDG NARRATIVE FOR VOLATILES IN AIR ANALYSES
SAMPLES RECEIVED: 4/17/98
SDG #: FPM041

For Samples:

P-9400-V-02-02-AA	P-2335-V-12-02-TB	P-205-V-02-02-FB
P-9400-V-02-02-TB	P-2335-V-12-02-AA	P-205-V-02-02-AA
P-9400-V-02-02-FB	P-2335-V-10-02-AA	P-205-V-01-02-AA
P-9400-V-04-02-AA	P-2335-V-11-02-FB	P-205-V-03-02-AA not reported
P-9400-V-03-02-AA	P-2335-V-11-02-AA	P-205-V-04-02-AA
P-9400-V-01-02-AA	P-2335-V-09-02-AA	P-205-V-05-02-AA
P-9400-V-06-02-AA		P-205-V-06-02-AA

The samples were analyzed according to EPA Method 5041, and the reporting format follows the requirements of the NYSDEC Analytical Service Protocol (ASP), Rev. 10/95.

The samples were reported for either the TCL compounds or the STAR compounds, as requested.

QC DATA

Surrogate and internal standards were within the QC limits. No surrogate recoveries and internal standard areas could be reported for sample P-9400-V-02-02-AA, because this sample was obviously skipped by the automated spiking apparatus.

A spare tube from the sampling was accidentally used to analyze the instrument ("method") blank on 5/1/98. Since contaminations were picked up during the trip, as evidenced in the (other) trip blank, this run cannot serve to determine method background contamination. The run for BFB tuning was therefore evaluated as method blank, to show instrument background. Since it contains a different amount of internal standard, it had to be quantified with external standard method. — OK

Compounds found in the method blanks were flagged with the qualifier "B" in the associated samples, i.e. run on the same day as the blank.

TUNING

Correct mass calibration (tuning) was checked with BFB against EPA acceptance criteria (Method 5041) in 12 hour intervals. Sample P-9400-V-06-02-A is outside the specified tune period by 15 minutes. This should not affect the acceptability of the data, because tune parameters on the instrument have been found to be very stable. — OK

CALIBRATION FOR TARGETED ANALYTES

Multipoint calibration at three concentration levels from 10 to 1000 ng was performed with internal standard calibration, using three internal standards, specified in Method 5041. For calibration of the STAR analytes, 1,4-difluorobenzene was used as internal standard. By omitting

H2M LABS, INC.

. SDG NARRATIVE FOR VOLATILES IN AIR ANALYSES
SAMPLES RECEIVED: 4/17/98
SDG #: FPM041

Vinyl chloride showed a RSD of 38 %, which exceeds the limit for CCC compounds. No Vinyl chloride was found in the samples
Inconsistent responses were obtained for the late eluting compound naphthalene. The reported results were computed with the average response factor, and the data are flagged with the qualifier "J" as estimated.

The continuous calibration evaluation forms (VII) for 5/1/98 for the TCL compounds are included for the internal standard method and external method. Form VII for the external method indicates some sensitivity change, (three CCC compounds exceed), whereas for the internal standard method all are compliant. The results for the BFB method blank were therefore computed with the response factors of the day for more accurate results.

SAMPLE ANALYSES

Instrument problems were experienced during the analysis of sample P-205-V-03-02-AA, and no data can be reported.

Two samples arrived with broken back tubes (Tenax / charcoal tubes). Only the front Tenax tube was analyzed, which should not affect the data. Only the STAR analytes were to be reported, i. e. low molecular weight analytes, which would break through the Tenax, were not targeted.

Sample P-9400-V-02-02-AA was quantified with external standard method, because the sample was not spiked with the internal standard solution, as previously mentioned. The method blank, (BFB run) was quantified with external standard method as well, as discussed above.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Date Reported: May 14, 1998

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Ursula Middel
Technical Manager

H2M LABS, INC.

QUALIFIERS FOR REPORTING ORGANICS DATA

Value - If the result is a value greater than or equal to the quantification limit, report the value.

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to

$$\frac{(330\ U)}{D} \times df \quad \text{where } D = \frac{100 - \%\ \text{moisture}}{100}$$

and df = dilution factor

For example, at 24% moisture, $D = \frac{100-24}{100} = 0.76$

$$\frac{(330\ U)}{.76} \times 10 = 4300\ U$$ rounded to the appropriate number of significant figures

For semivolatile soil samples, the extract must be concentrated to 0.5 mL, and the sensitivity of the analysis is not compromised by the cleanup procedures. Similarly, pesticide samples subjected to GPC are concentrated to 5.0 mL. Therefore, the CRQL values in Exhibit C will apply to all samples, regardless of cleanup. However, if a sample extract cannot be concentrated to the protocol-specified volume (see Exhibit C), this fact must be accounted for in reporting the sample quantitation limit.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified quantification limit but greater than zero. (e.g.: If limit of quantification is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.) The sample quantitation limit must be adjusted for dilution as discussed for the U flag.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P"

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a Laboratory-defined flag, discussed below

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of the peak representing the single isomer exceeds 200 ug/l or the peak representing the two coeluting isomers on that GC column exceeds 400 ug/l. Similarly, if the two 1,2-Dichloroethene isomers coelute, a diluted analysis is not required unless the concentration exceeds 400 ug/l.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine "A", "B", and "D" flags for some samples. The Laboratory defined flags limited to the letters "X", "Y" and "Z"

The combination of flags "BU" or "UB" is expressly prohibited. Blank contaminants are flagged "B" only when they are detected in the sample.

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No. P2335V1202TB

MATRIX : AIR

Sample ID. : @@9811532@@
Lab File ID : V3588.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane		10	U
Vinyl Chloride		10	U
Bromomethane		10	U
Chloroethane		10	U
1,1-Dichloroethene		10	U
Acetone		10	U
Carbon Disulfide		10	U
Methylene Chloride		16	B
2-Butanone		10	U
trans-1,2-Dichloroethene		10	U
cis-1,2-Dichloroethene		10	U
1,1-Dichloroethane		10	U
Chloroform		10	U
1,2-Dichloroethane		10	U
1,1,1-Trichloroethane		10	U
Carbon Tetrachloride		10	U
Trichloroethene		10	U
Benzene		3	
1,2-Dichloropropane		10	U
Bromodichloromethane		10	U
cis-1,3-Dichloropropene		10	U
trans-1,3-Dichloropropene		10	U
1,1,2-Trichloroethane		10	U
4-Methyl-2-Pentanone		10	U
2-Hexanone		10	U
Toluene		10	U
Tetrachloroethene		10	U
Dibromochloromethane		10	U
Chlorobenzene		10	U
Ethylbenzene		10	U
Xylene (total)		10	U
Styrene		10	U
Bromoform		10	U
1,1,2,2-Tetrachloroethane		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P2335V1202AA

MATRIX : AIR

Sample ID. : @@9811533@@
Lab File ID : V3589.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane		10	U
Vinyl Chloride		10	U
Bromomethane		10	U
Chloroethane		10	U
1,1-Dichloroethene		10	U
Acetone		42	B
Carbon Disulfide		10	U
Methylene Chloride		20	B
2-Butanone		10	U
trans-1,2-Dichloroethene		10	U
cis-1,2-Dichloroethene		10	U
1,1-Dichloroethane		10	U
Chloroform		10	U
1,2-Dichloroethane		10	U
1,1,1-Trichloroethane		10	U
Carbon Tetrachloride		10	U
Trichloroethene		10	U
Benzene		4	U
1,2-Dichloropropane		10	U
Bromodichloromethane		10	U
cis-1,3-Dichloropropene		10	U
trans-1,3-Dichloropropene		10	U
1,1,2-Trichloroethane		10	U
4-Methyl-2-Pentanone		10	U
2-Hexanone		10	U
Toluene		29	B
Tetrachloroethene		10	U
Dibromochloromethane		10	U
Chlorobenzene		10	U
Ethylbenzene		10	U
Xylene (total)		47	
Styrene		10	U
Bromoform		10	U
1,1,2,2-Tetrachloroethane		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P2335V1002AA

MATRIX : AIR

Sample ID. : @@9811534@@
Lab File ID : V3590.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane		10	U
Vinyl Chloride		10	U
Bromomethane		10	U
Chloroethane		10	U
1,1-Dichloroethene		10	U
Acetone		80	B
Carbon Disulfide		10	U
Methylene Chloride		15	B
2-Butanone		10	U
trans-1,2-Dichloroethene		10	U
cis-1,2-Dichloroethene		10	U
1,1-Dichloroethane		10	U
Chloroform		10	U
1,2-Dichloroethane		10	U
1,1,1-Trichloroethane		10	U
Carbon Tetrachloride		10	U
Trichloroethene		10	U
Benzene		15	U
1,2-Dichloropropane		10	U
Bromodichloromethane		10	U
cis-1,3-Dichloropropene		10	U
trans-1,3-Dichloropropene		10	U
1,1,2-Trichloroethane		10	U
4-Methyl-2-Pentanone		10	U
2-Hexanone		10	U
Toluene		83	B
Tetrachloroethene		10	U
Dibromochloromethane		10	U
Chlorobenzene		10	U
Ethylbenzene		21	
Xylene (total)		100	
Styrene		10	U
Bromoform		10	U
1,1,2,2-Tetrachloroethane		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P2335V1102FB

MATRIX : AIR

Sample ID. : @@9811535@@
Lab File ID : V3591.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane		10	U
Vinyl Chloride		10	U J
Bromomethane		10	U
Chloroethane		10	U J
1,1-Dichloroethene		10	U
Acetone		12	~~B~~ U
Carbon Disulfide		10	U
Methylene Chloride		14	~~B~~ U 5/14/98
2-Butanone		10	U J
trans-1,2-Dichloroethene		10	U
cis-1,2-Dichloroethene		10	U
1,1-Dichloroethane		10	U
Chloroform		10	U
1,2-Dichloroethane		10	U
1,1,1-Trichloroethane		10	U
Carbon Tetrachloride		10	U
Trichloroethene		10	U
Benzene		4	U
1,2-Dichloropropane		10	U
Bromodichloromethane		10	U
cis-1,3-Dichloropropene		10	U
trans-1,3-Dichloropropene		10	U
1,1,2-Trichloroethane		10	U
4-Methyl-2-Pentanone		10	U
2-Hexanone		10	U
Toluene		10	U
Tetrachloroethene		10	U
Dibromochloromethane		10	U
Chlorobenzene		10	U
Ethylbenzene		10	U
Xylene (total)		10	U
Styrene		10	U
Bromoform		10	U J
1,1,2,2-Tetrachloroethane		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No. P2335V1102AA

MATRIX : AIR

Sample ID. : @@9811536@@
Lab File ID : V3592.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane		10	U
Vinyl Chloride		10	U
Bromomethane		10	U
Chloroethane		10	U
1,1-Dichloroethene		10	U
Acetone		35	U
Carbon Disulfide		10	U
Methylene Chloride		14	U
2-Butanone		10	U
trans-1,2-Dichloroethene		10	U
cis-1,2-Dichloroethene		10	U
1,1-Dichloroethane		10	U
Chloroform		10	U
1,2-Dichloroethane		10	U
1,1,1-Trichloroethane		10	U
Carbon Tetrachloride		10	U
Trichloroethene		10	U
Benzene		9	U
1,2-Dichloropropane		10	U
Bromodichloromethane		10	U
cis-1,3-Dichloropropene		10	U
trans-1,3-Dichloropropene		10	U
1,1,2-Trichloroethane		10	U
4-Methyl-2-Pentanone		10	U
2-Hexanone		10	U
Toluene		28	
Tetrachloroethene		10	U
Dibromochloromethane		10	U
Chlorobenzene		10	U
Ethylbenzene		10	U
Xylene (total)		10	U
Styrene		10	U
Bromoform		10	U
1,1,2,2-Tetrachloroethane		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P2335V0902AA

MATRIX : AIR

Sample ID. : @@9811537@@
Lab File ID : V3593.D
Date/Time Analyzed: 05/01/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
Chloromethane	10	U	
Vinyl Chloride	10	U	J
Bromomethane	10	U	
Chloroethane	10	U	J
1,1-Dichloroethene	10	U	
Acetone	59	B	U 5/14/98
Carbon Disulfide	10	U	
Methylene Chloride	15	B	U
2-Butanone	10	U	J
trans-1,2-Dichloroethene	10	U	
cis-1,2-Dichloroethene	10	U	
1,1-Dichloroethane	10	U	
Chloroform	10	U	6/17/97
1,2-Dichloroethane	10	U	
1,1,1-Trichloroethane	10	U	
Carbon Tetrachloride	10	U	
Trichloroethene	10	U	
Benzene	7	U	5/12/98
1,2-Dichloropropane	10	U	
Bromodichloromethane	10	U	
cis-1,3-Dichloropropene	10	U	
trans-1,3-Dichloropropene	10	U	
1,1,2-Trichloroethane	10	U	
4-Methyl-2-Pentanone	10	U	
2-Hexanone	10	U	
Toluene	36	B	
Tetrachloroethene	10	U	
Dibromochloromethane	10	U	
Chlorobenzene	10	U	
Ethylbenzene	10		
Xylene (total)	65		
Styrene	10	U	
Bromoform	10	U	J
1,1,2,2-Tetrachloroethane	10	U	

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
~~@@9811526@@~~
P9400V02-02TB

MATRIX : AIR

Sample ID. : P9400V02-02TB 5996 4/30/98
Lab File ID : V3572.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		10	U
benzene		6	
toluene		10	U
ethylbenzene		10	U
m\p-xylene		10	U
o-xylene		10	U
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		10	U
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		10	U
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
P9400V02-02AA

MATRIX : AIR

Sample ID. : @@9811525@@
Lab File ID : V3571.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-t-butyl ether		10	U
benzene		12	U
toluene		49	
ethylbenzene		16	
m\p-xylene		62	
o-xylene		22	
isopropylbenzene		10	U
~~4-bromofluorobenzene~~ n-propylbenzene		10	U
1,3,5-trimethylbenzene		34	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		16	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	UR

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811527@@

MATRIX : AIR

Sample ID. : P9400V02-02FB 5996 4/30/98
Lab File ID : V3573.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		13	
benzene		10	U
toluene		30	
ethylbenzene		10	U
m\p-xylene		37	
o-xylene		13	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		23	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		12	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		30	J

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811528@@

MATRIX : AIR

Sample ID. : P9400V04-02AA 5996 4/30/98
Lab File ID : V3574.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result : ng	
methyl-tert-butylether	10	U
benzene	7	U
toluene	35	
ethylbenzene	12	
m\p-xylene	52	
o-xylene	18	
isopropylbenzene	10	U
n-propylbenzene	15	
1,3,5-trimethylbenzene	110	
tert-butylbenzene	10	U
1,2,4-trimethylbenzene	91	
sec-butylbenzene	10	U
4-isopropyltoluene	10	U
n-butylbenzene	10	U
naphthalene	10	U R

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811530@@

MATRIX : AIR

Sample ID. : P9400V01-02AA 5996 4/30/98
Lab File ID : V3576.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		70	
benzene		29	U
toluene		80	
ethylbenzene		18	
m\p-xylene		69	
o-xylene		20	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		21	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		10	U
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

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VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811531@@

MATRIX : AIR

Sample ID. : P9400V06-02AA 5996 4/30/98
Lab File ID : V3577.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		81	
benzene		31	
toluene		120	
ethylbenzene		11	
m\p-xylene		33	
o-xylene		14	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		43	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		40	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811538@@

MATRIX : AIR

Sample ID. : P205V-02-02FB 5996 4/30/98
Lab File ID : V3578.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		10	U
benzene		3	U
toluene		10	U
ethylbenzene		10	U
m\p-xylene		10	U
o-xylene		10	U
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		10	U
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		10	U
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

6/17/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811539@@

MATRIX : AIR

Sample ID. : P205V-02-02AA 5996 4/30/98
Lab File ID : V3579.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		10	U
benzene		5	U
toluene		26	
ethylbenzene		10	U
m\p-xylene		33	
o-xylene		10	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		19	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		13	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

6/17/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811540@@

MATRIX : AIR

Sample ID. : P205V-01-02AA 5996 4/30/98
Lab File ID : V3580.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		44	
benzene		14	U
toluene		55	
ethylbenzene		13	
m\p-xylene		50	
o-xylene		15	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		19	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		10	U
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

6/17/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811541@@

MATRIX : AIR

Sample ID. : P205V-03-02AA 5996 4/30/98
Lab File ID : V3581.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		320	
benzene		130	
toluene		470	
ethylbenzene		65	
m\p-xylene		250	
o-xylene		92	
isopropylbenzene		10	U
n-propylbenzene		16	
1,3,5-trimethylbenzene		110	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		97	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		14	J

5/17

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811542@@

MATRIX : AIR

Sample ID. : P205V-04-02AA 5996 4/30/98
Lab File ID : V3582.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		54	
benzene		9	U
toluene		66	
ethylbenzene		17	
m\p-xylene		63	
o-xylene		19	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		30	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		20	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

6/17/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811543@@

MATRIX : AIR

Sample ID. : P205V-05-02AA 5996 4/30/98
Lab File ID : V3583.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result : ng	
methyl-tert-butylether	10	U
benzene	9	U
toluene	55	
ethylbenzene	15	
m\p-xylene	59	
o-xylene	18	
isopropylbenzene	10	U
n-propylbenzene	10	U
1,3,5-trimethylbenzene	31	
tert-butylbenzene	10	U
1,2,4-trimethylbenzene	21	
sec-butylbenzene	10	U
4-isopropyltoluene	10	U
n-butylbenzene	10	U
naphthalene	10	U R

6/12/98

1A

VOLATILE ORGANIC ANALYSIS DATA SHEET

H2M LABS INC.

Sample No.
@@9811544@@

MATRIX : AIR

Sample ID. : P205V-06-02AA 5996 4/30/98
Lab File ID : V3584.D
Date/Time Analyzed: 04/30/98
Instument ID: 5996

Split Factor : 1 : 1
Quant Range : 10 to 1000

COMPOUND NAME:	Result :	ng	
methyl-tert-butylether		10	
benzene		8	Y
toluene		44	
ethylbenzene		11	
m\p-xylene		45	
o-xylene		13	
isopropylbenzene		10	U
n-propylbenzene		10	U
1,3,5-trimethylbenzene		21	
tert-butylbenzene		10	U
1,2,4-trimethylbenzene		12	
sec-butylbenzene		10	U
4-isopropyltoluene		10	U
n-butylbenzene		10	U
naphthalene		10	U R

6/17/98